THE JOURNAL OF DENTAL EDUCATION

A QUARTERLY FOR THE DENTAL TEACHER

VOLUME 14 MARCH, 1950 NUMBER 3

The present is suspended between a great memory and a great hope—memory of what men did in the past, and hope of what they will do in the future.—Author not known.

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JOURNAL of DENTAL EDUCATION

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The New Look

It is not always good policy to comment editorially on material appearing in the same issue of the JOURNAL. However, some rules are not iron-clad and in this instance there is a good reason for changing the order.

The College News items in this issue of the JOURNAL are of a different nature than has been the case before. All news items coming in for this issue consisted of comments. Some held over from January were personal. Attention is called to this fact because of the possible value to be noted, that value lying within the scope of "what is" and "what used to be." Not too many years ago there were no graduate or postgraduate courses other than an association meeting or that of some similar group. Today these courses are conducted in the main by the schools and the performance is continuous when considered from the over-all standpoint.

Personal items are always important and ordinarily the department to which reference has been made is given almost wholly to that. It was interesting to note that material submitted for this issue bore nothing of personal mention save only as connected with the main event, the study-course to be held. Does this indicate a change or changes within the profession due to the present curriculum as compared to the old and will there be further change or changes, should the curriculum again be revamped? The old curriculum was centered, to no small extent, around the principle of "mechanics"; the present curriculum being centered around the field of science with particular reference to the "basic sciences." Now what about the center around which the new curriculum shall be written?

—*Ed.*

CLINICAL DIAGNOSIS AND TREATMENT OF COMMON TEMPOROMANDIBULAR DISTURBANCES*

GEORGE A. HUGHES, D.D.S.,† *San Francisco*

For the past quarter of a century, numerous investigators have been proclaiming the responsibility of the dentist concerning the diagnosis and treatment of temporomandibular disturbances. The symptoms of these disturbances are well known and many of the etiological factors have been ascertained. A survey of the literature, however, reveals but little of actual clinical value to the dentist in confirming the diagnosis and treatment of the condition. Many of the conditions referred to in the medical and dental journals are seldom experienced and are of such a nature that surgical treatment is indicated.[1 to 10] The better methods of diagnosis depend upon laminagrams or tomagrams which are not readily available in most communities.[11 to 13]

A study of some 75 clinical cases at the University of California has been carried on during the past several years. While as yet incomplete, the study has given some interesting results in the diagnosis and treatment of temporomandibular disturbances of common occurrences which should be of value to the practicing dentist. A survey of the cases studied reveals that the etiological factors may be classed into the following groups: (1) acute traumatic; (2) chronic traumatic; (3) infection; (4) psychoneurotic; and (5) miscellaneous. (Figure 1.)

The remainder of this report will deal with cases presenting traumatic factors.

A differential diagnosis is made based upon a routine case history covering both objective and subjective factors. This diagnosis is checked in cases presenting traumatic factors by the use of latex splints when natural teeth are present and by acrylic splints when numerous teeth are missing. In acute cases, X-rays have been found of little value. In chronic cases, however, X-rays frequently are of value if the joint area is clearly defined.

Anatomists, at the present time, disagree as to the cause of pain noted by many patients presenting temporomandibular joint difficulties.[14-15] One school of thought insists that no nerves are directly involved and another school of thought claims that any malposition of the joint will cause pressure upon nerves, e.g., the chorda tympani and the

*Presented before the International Association for Dental Research, Rochester, June, 1948.

†Professor of Denture Prosthesis and Head of the Department, College of Dentistry, University of California.

Reference notes (1 to 16, inc.) on page 138.

auriculotemporal nerves.[15] In cases where almost instantaneous relief follows the use of even temporary splints, it would seem that direct neural involvement might well be suspected. Anatomists do agree that the temporomandibular joint is a non-stress bearing joint.[16] The stress

COMMON CAUSES OF TEMPOROMANDIBULAR JOINT DISTURBANCES

I Acute Traumatic
- A Sprains due to prolonged opening
  - Long dental appointments
  - Extractions or tonsillectomies
  - Laughing, vocalizing, or yawning
- B Sprains due to mastication
  - Brittle, fibrous, or tough foods
  - Unilateral mastication
- C Sleeping habits

II Chronic Traumatic
- A Prolonged acute conditions
- B Malocclusions
  - Natural
  - Faulty restorative treatment
  - Orthodontic treatment
  - Missing teeth

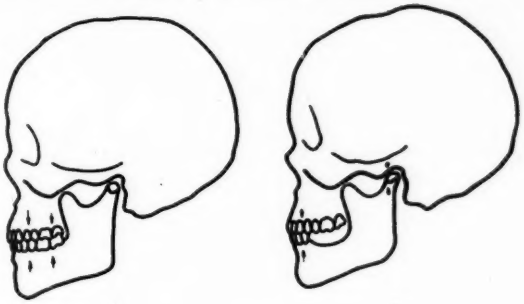
III Infections
- A Third molars
  - Erupting
  - Impacted
- B Residual

IV Psychoneurosis

V Miscellaneous
- A Osseous nodules
- B Ankylosis
- C Fractures
- D Unknown

Figure 1

of mastication being withstood by the teeth in centric and functional occlusal relations. The loss of teeth and subsequent derangement of occlusal relations modifies the natural joint harmony and usually subjects the temporomandibular joint to muscular stresses. (Figures 2 and 3.)



A B

FIGURE 2

A comparative study of skulls will reveal information which may also be observed by a roentgenographic study of clinical cases: (1) in cases presenting fine examples of natural occlusal harmony, there is ample space between the head of the condyles and the glenoid fossae; (2) the angulation of the glenoid is within normal limits, and (3) both the eminentia and the condyle are smooth and rounded. (Figure 4.)

In cases where posterior teeth have been missing over a long period of time, (1) there is little or no space between the head of the condyle and the glenoid fossa, (2) the inclination of the glenoid fossa is frequently excessively steep, and (3) erosion of the head of the condyle and the eminentia is commonly observed in extreme cases. (Figures 5 and 6.)

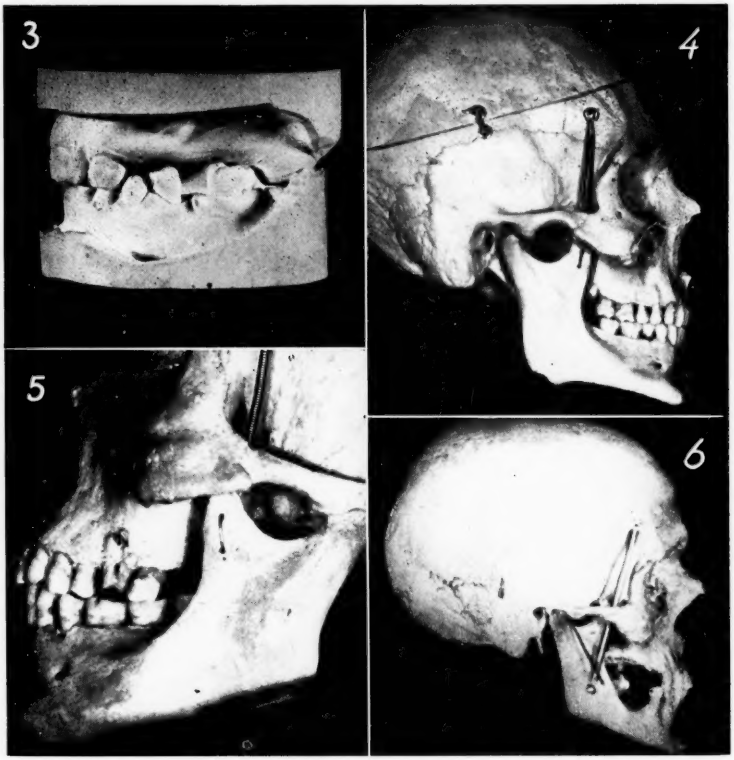
It is readily understandable from the above, that anything which would interfere with the normal relationship of the condyles in the glenoid fossae would be a probable source of the common symptoms, pain, trismus crepitus, nervous disorder, and so forth.

In cases presenting acute traumatic factors, it would seem that the meniscus has become temporarily enlarged and that normal occlusal relations cause undue pressure upon the temporomandibular joint as a whole. The usual treatment has been to immobilize the joint by ligating the mandibular to the maxillary teeth. This places the condyles in a normal position in the glenoid fossae but does not remove pressure on

the joint if swelling exists. In those cases presenting acute traumatic factors and where posterior teeth are present, the use of a latex splint, thicker in the posterior than in the anterior, will in effect raise the occlusion posteriorly—relieving the joint of pressure exerted by the powerful muscles of closure. (Figures 7 and 8.)

After the case becomes normal, the patient is instructed how to avoid further recurrence of the condition. In these cases the diagnosis is confirmed and treatment effected in one operation.

In cases where posterior teeth are missing, the use of either vulcanite or acrylic splints is substituted as the latex is too flexible to maintain its form without support of the natural teeth. (Figures 9 and 10.) It should



FIGURES 3, 4, 5, 6

be noted that the thickness of splints should not exceed the freeway space or soreness and possible damage to the teeth, mucosa and osseous structure may result.

In chronic cases, the diagnosis can frequently be verified by means of a latex splint if there are sufficient posterior teeth present to carry the occlusal stress. Where there are not sufficient teeth present to carry the stress, the use of a more rigid material such as acrylic or vulcanite is employed, both to verify the diagnosis and give preliminary treatment. The final plan of treatment, if adequate correction is to be effected, frequently becomes quite involved requiring anything from a simple spot grinding of faulty occlusal contact to a complete reconstruction. In chronic traumatic cases when either complete or partial dentures are

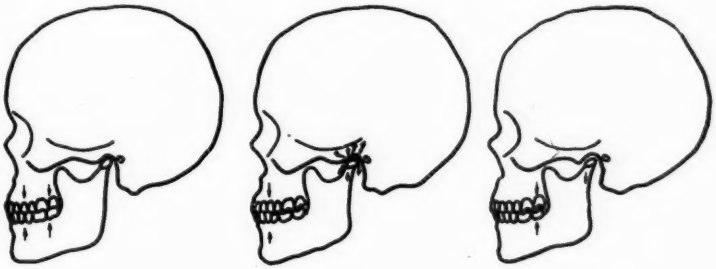
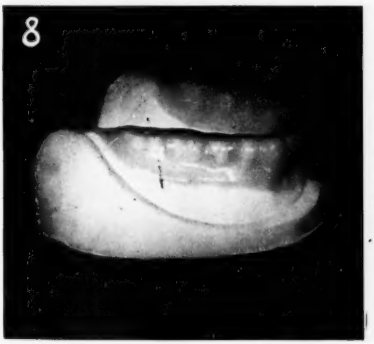


FIGURE 7



FIGURES 8, 9

worn, the following plan of treatment has been found effective. If the patient is wearing dentures, the diagnosis is verified by the use of a latex splint. If relief is noted, new dentures are advised with special attention to securing maximum bearing area and correct maxillo-mandibular relations. The teeth are set up and the dentures with teeth set in wax are checked in the patient's mouth, with regard to esthetic and concert centric occlusion. (Figure 11-i.) The upper denture is processed and returned to the articulator on its original cast and remounted in such a manner that it may be removed and returned to the articulator. (Figure 11–a, b, c, d, e.)

The occlusion is carefully checked on the articulator adjusting the lower teeth if necessary to compensate for derangement of the upper cast during processing. (Figure 11-e.) A single thickness of baseplate wax is now placed over the second bicuspid and molar teeth of the upper denture and sealed to the buccal and lingual surfaces. (Figure 11-f.) With the wax slightly warmed, the cast is placed in the mouth and the patient instructed to close in centric against the waxed-up lower cast. Closure is effected until the cuspids and first bicuspids are in proper contact. (Figure 11-g.) More or less than one thickness of wax may be required dependent upon the ease with which the condyle dis-

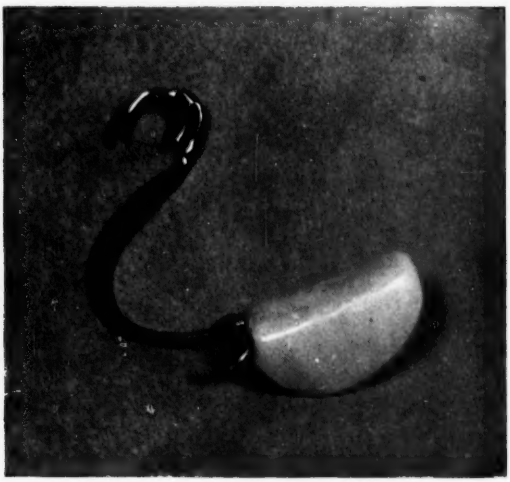


FIGURE 10

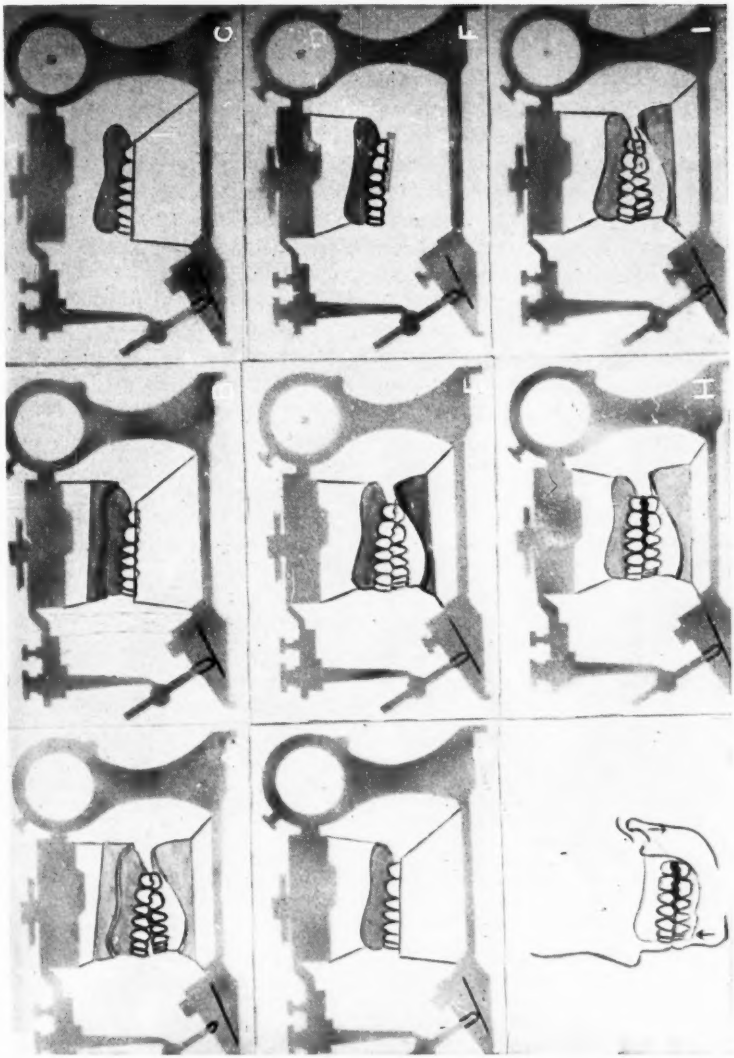


FIGURE 11 (a-l)

places downward. The cast is now returned to the articulator and the lower cast remounted to the newly establishd posterior vertical relation. (Figure 11-h.) The lower teeth are now elevated into correct occlusion. (Figure 11-i.) The lower cast is now completed in the usual manner.

When the cast is first placed in the mouth, the patient may feel excessive pressure in the molar area for a few hours. Unless error has occurred, this sensation soon disappears without undue soreness of the oral tissue in the molar region. In extreme cases when insufficient opening has been provided, or where it is judged unwise to risk sufficient opening in one operation, further relief can be afforded by reducing the length of the anterior teeth including the bicuspids.

The material presented above can be considered but a progress report on a long-time clinical problem. The favorable results obtained to date on those cases where the etiology is clear cut seems to justify a general dissemination of the methods of diagnosis and treatment used. It is hoped that this information may be a clinical aid to the dentist in general practice in the diagnosis and treatment of common temporomandibular disturbances of traumatic origin.

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ON THE TEACHING OF DENTAL JOURNALISM

E. FRANK INSKIPP, D.D.S.,[1] *San Francisco*

It may be said that the literature of a profession is its soul! Educators in all fields will, in the main, admit this as a basic truth when the subject is presented to them in its most effective light. Unfortunately, the light does not shine the same on all individuals. It has to be refocussed. We found this in a form letter, carefully prepared and several times revamped, mailed to dentistry's leading educators, its college deans. The words of the letter were the same, but they were read in almost as many ways as there were deans replying, some even saw nothing to which to reply. Yet it concerned the life blood of the dental profession, its literature, and the importance of bringing it before the dental undergraduate before he leaves the institution to which he has learned to look for guidance.

In the fall of 1948, the writer, as president of the American Association of Dental Editors, addressed a communication to all deans of dental schools. Fundamentally it was to serve two purposes, one, to ascertain the extent to which dental students were informed as to the profession's own literature, its standards and principles, together with the purposes and ideals of the American Association of Dental Editors; secondly, to obtain opinions regarding the introduction of a course wholly, or in part, which would incorporate these principles.

Replies and opinions varied, some because of definite convictions on the subject presented; some because of a marked misunderstanding of the request. To discuss the last first, it was not the intention of the president, nor the executive board of the A.A.D.E. to recommend that a course in journalism or English be added to the dental curriculum. It is our opinion that, when applicants for entry into the dental school have had from two to five years of college training, the dental faculty is justified in expecting them to have a reasonably well rounded education in the writing of theses and an appreciation of literature in general. However, there is a need to use this basic knowledge and introduce the students to the literature of dentistry, its journals and to the ideals and principles as set forth by those who have tried, with some success, to establish a code for the profession's publications.

Innumerable graduates leave the dental school lacking even the faintest idea that each journal they receive has a purpose for its existence; that having a paper printed in one publication makes it as authoritative as when it appears in another. Many are elected to editorships of local society journals and then learn of the existence of the Association of Dental Editors for the first time. By the time they have learned its prin-

[1]Assistant Clinical Professor of Operative Dentistry, College of Physicians and Surgeons, School of Dentistry; President, American Association of Dental Editors.

ciples and purposes and the code by which it tries to live, a new editor is elected, frequently with the same background—or shall I say, lack of it.

A number of schools do present to their students, through the medium of a specially designed course, or as part of one which so permits, the story of dental journalism and the writing of papers for professional literature. A summary of the response to our communication to the forty dental schools in the United States and five in Canada is as follows:

No replies were received from eleven schools. Thirteen stated that no instruction was given in any aspects of dental journalism. Eleven covered the subject well, either in a separate course or in one sufficiently allied to it to cover the material adequately. Ten gave scattered lectures of instruction which mentioned dental journalism in other, non-related courses.

Even in this summary, there was considerable range of opinion among the deans, also in the enthusiasm, or lack of it, found in the subject. One school provides its students with a specially prepared manual; this however covers considerable instruction on the writing of papers, but little on the principles of journalism as adopted by the dental profession. In two schools, the course had been introduced as recently as 1948.

Among those dental schools which had scattered instruction, four deans favored a greater emphasis and were looking forward to either finding more time for such instruction or in persuading a member of the faculty with the knowledge and interest to undertake the extension of the program.

While submitting the answer "no course," some of the thirteen (four) not only favored the teaching of the subject, but were sufficiently concerned about its omission that they were making every effort to find room for it in an already crowded curriculum. One stated that, having been "crowded out," some effort was being made to have the dental picture added in the school of journalism.

While a few deans replied that no instruction was given and gave no opinions, only one reply was completely discouraging. It stated that instruction in dental journalism was "neither necessary nor desirable in a dental school!"

Endeavoring to solve the problem of an already full curriculum and yet not omit this important topic altogether, one suggested that, since only a limited number of graduates eventually become interested in editorial work, that this be given as an extra course, perhaps in the obtaining of a bachelor's degree or in the "honors" curriculum. But as all dentists may, and at some time invariably do, write papers on some phase of dentistry, this idea would eliminate many and confine instruction only to

those who think they *may* be invited, appointed, or elected to be editors. A somewhat imaginative comparison might be that instruction in traffic regulations be limited to the members of the police department.

It has been quite evident in this study that those educators who have had much to do with dental journalism, either serving as editors or active (not merely honorary) members of editorial staffs, agree that there is a definite need for dental students to receive instruction in the literature of their profession and in the presentation of papers to that literature; not a course in English or thesis writing in general, but an adaptation of the knowledge they have already gained in their general studies, to that of dentistry.

A recommended list of subject material which should be covered could be as follows:

The principles of Dental Journalism; this should include information regarding the activities and purpose of the American Association of Dental Editors, and their relation to the general picture of the American Dental Association, particularly in regard to ethics, advertising policy and dignified publicity.

Types of dental journals should be discussed, those representing the profession itself, and those of a proprietary nature, such as house organs.

Customs and accepted procedures in the publication of the literature of the dental profession should be explained, particularly as they differ from the general pattern of printed matter.

As an individual project, a paper could be prepared, specifically as for publication in a dental journal. This should contain all the essential factors and mechanical requirements for a paper to be presented to a dental editor. This instruction should include a discussion of the type of journal to which the paper should be presented, the ownership of the paper if presented before a dental society, the use and preparation of illustrations, the purpose, use and abuse of reprints and the avoidance of "puffs" or boosting of proprietary products.

As a handbook of reference, the newly published "Manual for Dental Editors" is recommended. This manual has been prepared by a committee of the American Association of Dental Editors, and while subject to some criticism on minor matters due to individual opinions, its basic concepts have long been acceptable as fundamental and in conformity with the recognized standards of journalism, of dentistry, and of the American Dental Association. All too frequently, we meet dental editors that regret having had no formal instruction in these matters. It takes but a few hours when assigned to a qualified faculty member, yet it means so much to dentistry and its literature.

CONFERENCE SESSIONS

(The following papers were presented before various sessions as indicated, at the annual meeting of the American Association of Dental Schools, Chicago, June 27-29, 1949. Ed.)

1. Clinic Administration: W. I. McNeil, D.D.S., Loyola University, Chicago, Presiding
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(To Be Continued)

1. CLINIC ADMINISTRATION

A. *Cooperation and Consultation of the Various Clinical Departments*

THOMAS R. ABBOTT, DDS.,[1] *Milwaukee*

In discussing the subject, "Cooperation and Consultation of the Various Clinical Departments," I am cognizant of the fact that all dental schools do not use the same methods of administration in the operation of their clinics and, therefore, have a variation of problems relative to this subject. My discussion will, of necessity, deal with the methods and problems of the Marquette University Dental School.

There is important and impelling need for close cooperation and consultation of the various clinical departments. It would seem that any department which is to have a part in the final diagnosis and plan of treatment should also have the privilege of seeing the patient in consultation. The ideal method of obtaining the best results would seem to be a full-time instructor as the head of each of the clinical departments. This head would be available at all times for consultation and would accept the responsibility for the cooperation with the other clinical departments. At the present time, we do not have a full-time instructor as the head of each of the various clinical departments; we are, however,

[1]Director of Clinics, College of Dentistry, Marquette University.

working toward that goal and hope that it won't be too long before our aim is realized.

In order to obtain the maximum efficiency and cooperation from any clinical department, there must be a complete cooperation and coordination of all instructors of the department, and also a thorough correlation of effort with the pre-clinical department. It is our aim to have the pre-clinical and clinical departments, of each phase of dental teaching, taught by the same instructors of the dental faculty. We believe, that in this manner, differences of opinion in the various departments are kept at a minimum. The technics and procedures taught in our pre-clinical courses are the same technics and procedures which will be followed by the student and clinical instructor in the dental clinic. There are very few exceptions to the rule of instructors in the clinic not instructing in the pre-clinical courses and vice versa.

An outline of the complete technics followed for gold foil, gold inlay, silver amalgam, and silicate cement restorations is used by our department of operative dentistry. A manual used by the oral medicine department is at the present time undergoing revision and will again be used as a guide for that department. It is our thought that the use of either an outline or manual eliminates, to a great degree, controversial technics, and obtains better teaching results and cooperation, especially among part-time instructors.

We make every effort to show the student the close relationship between the theoretical instruction and its practical application in the dental clinic. To do this requires close cooperation between the various departments and a harmonious relation within them, brought about by frequent meetings and discussion of problems. Meetings of the various clinical departments are held at the call of the department head. At these meetings problems within the department are discussd and also differences of opinion in regard to the various technics which are taught. Regular monthly clinical faculty meetings are held with the idea of promoting cooperation and understanding between the various clinical departments. We try, at each meeting, to have the head of at least one of the various departments give a resume of their methods and ideas, so that other members of the clinical faculty may ask questions and discuss any of the problems that may have arisen in the clinical teaching.

An explanation of our system of dealing with clinical patients is necessary in discussing the problem of consultation of the various clinical departments. A patient after registering in our clinic is examined first by an instructor in an examination room which might be classified as

a screening or routing room. This initial examination room is many times referred to as the "Hub" of our clinic. Patients are assigned from this room to the various departments of the clinic, and also directly to the student, depending on the type of service required. We, in our clinic, cooperate with many of the social service organizations in our city, such as the Family Service, Catholic Social Welfare Association, St. Vincent de Paul Society, State Aid, Old Age Assistance, County Home for Dependent Children and many others too numerous to mention. These associations usually ask for an estimate of the cost of the service to be rendered before authorizing us to go ahead with the service for the patient. This being the case, much of our consultation with the various departments is done in our initial examination room in order to arrive at a diagnosis, so that a reasonably accurate estimate of the cost of the service can be given.

Most of our patients, however, chosen for clinical treatment, after having a tentative diagnosis made in the examination room, are assigned to a student requiring the type of work available. If the necessary radiographs have not been made the student takes his patient to the radiographic department as his first step. He then takes his patient to the oral medicine department and charts the history of the case and the present findings. He is then issued a slip for a dental prophylaxis and completes that service in the oral medicine department. The next step, before any operative procedures may be started, is a completion of the diagnosis and plan of treatment. A complete dental examination and plan of treatment is made for all patients assigned to a student, whether the patient intends to follow through with a complete dental service or not. There are times when the ideal plan or procedure cannot be followed entirely because of reasons advanced by the patient. The student assigned to the patient makes the diagnosis and plan of treatment. It is his responsibility to obtain the various consultations necessary for the case and check the final diagnosis and treatment plan to an instructor in the operative dentistry department. The question of which department should check the final diagnosis and treatment plan is one which has given us much concern. Since almost every patient's case centers around one department, it would seem that individual department heads and their assistants are better qualified to supervise a final diagnosis and plan of treatment for their department, than any one individual acting for all departments.

Patients requiring specialized types of service do not have their diagnosis and treatment plan checked by the operative dentistry department.

Some instructors of our faculty are of the opinion that the checking of the final diagnosis and plan of treatment should be done by the oral diagnosis department. Inasmuch as it is our policy to assign patients, requiring various types of dental service from this initial examination room to students in the dental clinic, it can be readily understood that many consultations with instructors of the various departments are held before the patient is assigned to a student. The instructor in charge of the examination room does not attempt to rule on the type of service required for every patient, but rather consults with the various departments concerned in order to arrive at a diagnosis for the assignment of the patient. The weakness in this plan of consultation and assignment of patients lies in the fact that, up to this time, students have not been assigned to this examination room and, therefore, do not receive the benefit of the discussions and consultations of the various clinical instructors. It is our hope that with the beginning of the fall (1949) semester students will be assigned to this examination room for observation. Patients who report to our clinic with physical complaints or for oral surgery procedures are referred to our oral diagnosis department, where a complete medical history is taken and such other procedures as are necessary for the proper care of the case. Students are assigned to the oral diagnosis department for one week at a time and are assigned so that the student taking the patient's history can act as the assistant to the oral surgeon at the time the surgery is performed. This department operates under a part-time physician, a full-time dentist and a laboratory technician. We are of the opinion that many opportunities to correlate the basic sciences with clinical teaching occur during the taking of case histories, looking for possible etiologic factors regarding the patient's condition and the making of diagnoses and plans of treatment. The final diagnosis of any case must be the result of:

1. The clinical and laboratory examination.
2. The consultation with the various departments.
3. The plan of treatment.

At our school most of our clinical departments operate on a full-time basis, making it possible for a student to work at any time in any department. Radiography, exodontia, oral medicine, operative dentistry, crown and fixed partial denture prosthesis, and prosthetics are departments which operate at all times. The departments of oral surgery, surgical periodontia, and orthodontia operate on a part-time basis. With clinics operating on a full-time basis the problems of consultations between the various departments is not a very complicated or difficult one.

Consultations with instructors of the various clinical departments should always be noted on the patient's chart and signed by the doctor consulted. Many times difficulties arise because of the failure to note the consultation with signature. I should like to offer the following case as an example:

A female patient E. D. reported to the dental clinic on December 21, 1948, from the State Rehabilitation Department. The patient was 19 years of age. She gave a history of epilepsy and was under the care of a physician. There had been no seizures for the past six months.

Her present complaint was an upper left, central incisor, loose and somewhat elongated; had apparently been injured by someone placing a pencil between the teeth during an epileptic seizure.

A complete dental radiograph was made and the patient referred to the oral diagnosis department. The patient was told to bring a report of her medication at the time of her next appointment.

Medication: Sodium dilantin—4 times a day; Phenol Barbital—4 times a day.

Oral Diagnosis:

Radiographic examination revealed fracture of the upper left central incisor about ⅓ the distance from the apex of the root.

Advised consultation with orthodontic department.

Prognosis poor for orthodontic treatment.

Consultation advised with crown and fixed partial denture prosthesis department and prosthetics department:

Advised extraction of upper left central incisor and construction of cast partial denture. (Consultation signed with initials of instructors of all departments and the instructor arranging the consultation.)

An estimate of cost of dental service on the above diagnosis was sent to the organization and the tooth was extracted, February 17, 1949.

When the student appeared with the patient in the prosthetic department for impressions, the instructor who had taken part in the consultation and resulting diagnosis refused the case as a prosthetic case, and called another consultation with a different instructor of the crown and fixed partial denture prosthesis department, claiming that he had never seen the case. The result was a changed plan of treatment to a fixed bridge. This case is not cited for the purpose of criticism of the instructor for changing the diagnosis, because we believe that it should be the prerogative of any instructor to change his diagnosis or plan of treatment if he sees fit, but rather to call attention to the necessity of each instructor called in consultation signing his own name to the consultation notes. The fact that many patients report for examinations and then are not seen again for some interval of time makes it entirely

possible for an instructor to forget that he has ever seen the patient. I repeat, it should always be the privilege of any instructor to change his opinion in regard to the diagnosis and plan of treatment.

In Summary: Cooperation of the clinical departments is best obtained:

1. By having a full-time instructor as the head of each department, and by having the clinical faculty composed of the same men who teach the pre-clinical courses.
2. By the use of outlines or manuals for the various departments, so as to prevent the injection of personal ideas or technics.
3. By frequent meetings of the various clinical departments and regular meetings of the entire clinical staff with the idea of promoting discussions and arriving at conclusions which will bring about better cooperation of the departments with one another.

Consultation of the various clinical departments is dependent upon the system of administration used in the dental clinic. The problems differ in different schools.

Consultations at our clinic obtained:

1. By the instructor in the initial examination room, requesting consultation of the instructors from the various departments concerned.
2. By the student assigned to the patient before his final diagnosis and plan of treatment can be accepted.
3. By the oral diagnosis division of clinic practice, for those patients referred to it for diagnoses.

B. *Evaluation of Clinical Accomplishments of Students*

J. KREUTZER, D.D.S., B.Sc.(Dent.),[1] *Toronto*

The evaluation of practical achievements and progress of students in the field of clinical dentistry has evoked much thought and study by dental teachers in the past decade.

The problem of clinical assessment is not a simple matter of sifting out the low students or failures from those with high standards of attainment, but rather it is to produce an order of merit showing the relative ability of all the students in the class. Such assessment cannot be obtained by subjecting students to a few practical tests periodically, such as having them perform a number of specified operations on selected patients. Such tests are unfair because no two patients are alike in their nervous reactions or temperaments when undergoing treatment; nor is the type of operative problems exactly alike for all; nor are students at

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their best when subjected to the nervous tension which is frequently associated with practical examinations. It is felt that a truer evaluation can be obtained by having the instructors mark each student frequently and on every possible occasion throughout the clinical course and under operating conditions which are normal for both student and patient. The instructor should take into account not only the technical skill shown but also the various personal factors that are looked for in a professional man. When the human element as well as practical skill have to be judged, the problem of marking becomes difficult. At no time is it as simple, as for example, the scoring of a written examination of a mathematical nature which may involve only a single mental operation and has an answer which is either right or wrong. Marking in clinical dentistry is also inevitably subject to the inconsistencies of human judgment and the vagaries of personal impressions or prejudices of the instructor. Variations in judgment exist between different examiners for the identical performance by the student, as well as by the same instructor at different times. Complete standardization cannot be achieved, but to offset somewhat these inconsistencies and to approach a truer evaluation of each student's work and personal attributes, it can be stated that, if marks are given on several occasions by the different examiners for any observed performances or interviews with the student, then when these marks are totalled and averaged, the final score will represent a fair estimate of that student's attainment.

The manner and method of evaluating clinical accomplishments in the Faculty of Dentistry, University of Toronto, is as follows:

CLINICAL RECORD CARD

Date	Chart No.	Nature of Service	Professional Decorum 10	Inst. and Equip. 10	Planning and Practise 10	Knowledge and Skill 100

Name *Year* *Session* *Chair No.*

FIGURE 1.

Every clinical instructor has a loose leaf book which contains a clinical record card for each individual student in the two clinical years.

This card is divided into several columns indicating:

1. The nature of the service.
2. Professional decorum.
3. Condition and availability of instruments and equipment.
4. Treatment planning and orderly practice.
5. Knowledge and skill.

The student is marked on a percentage basis for any or all of these at the discretion of the examiner.

A. Nature of Service

This includes any of the phases or steps in

(a) Operative procedures of any nature, e.g., cavity preparation, pulp protection, finished restoration
(b) Procedures in dental surgery
(c) Partial and full denture prosthesis

B. Professional Decorum

The following sub-headings are included:

1. Cleanliness and neatness of person
2. Attitude toward patient:
   (a) Patients should receive the same courtesy as one would accord a guest.
   (b) Practice: Honest consideration of the patient's convenience and personal feelings and the desire to render the best possible service.

C. Condition and Availability of Instruments and Equipment

1. Each student is responsible for the care of his own chair, unit and cabinet.
2. Corroded, broken and dull instruments, either on the operating tray or in the instrument cabinet, are considered a basis for the discount of marks.
3. Standardized operating tray set-ups, as required by the various departments, must be available when required.
4. The arrangements of instruments in cabinets as outlined by the Faculty must be rigidly observed. Inspection of cabinets is routine at the time of the final examination of every chart.

D. Treatment Planning and Orderly Practice

1. Relief of discomfort—this would entail use of diagnostic procedures about the area causing discomfort.
2. Complete clinical examination procedure.
3. Statement of diagnosis, suggested treatment and prognosis recorded on chart.
4. Dietetic and other suggestions to patients.
5. Reduction of oral sepsis before other operative procedures are performed.
6. Extractions of hopelessly diseased teeth—if immediate replacements are to be employed, extractions will follow preparation of replacement.
7. Trial treatments for teeth of questionable prognosis (e.g. teeth with deep cavities, etc.) should be instituted early.

8. Occlusal correction when indicated, either by grinding or orthodontic treatment. This should precede restorative procedures and have as its objective the correction, rather than the perpetuation of abnormalities.
9. Confine operations which may cause discomfort or inconvenience to one area at a time, if at all possible.
10. A closely related series of appointments is found usually most satisfactory and most successful with patients.
11. Instruction of patients in the hygiene of the mouth and the care of restorations.
12. Final occlusal correction.
13. Polishing of all restorations and tooth surfaces.

E. Knowlegde and Technical Skill

The following criteria are used to assess the evidences of a stduent's knowledge and technical skill, as it is indicated by the partially or wholly completed clinical service:

1. Has the patient been efficiently relieved of discomfort?
2. Has the prevention of future discomfort been efficiently accomplished?
3. Have all general health conditions, which may be either a result or a cause of the dental abnormalities, been satisfactorily considered and efficiently dealt with?
4. Has the function of the mouth been satisfactorily restored or improved?
5. Is the result aesthetically pleasing?

Basis in Grading and Scoring of Students

The chief aim in grading is to arrange candidates in a relative order of merit. Scoring, on the other hand, represents the final estimate of the student's accomplishments in percentage marks, which can be arranged in relative order of sequence for the class.

Scoring has a prescribed range between zero and 100. To guide the instructors along a more uniform basis of percentage scoring, the range is separated into the following four levels of achievement:

Poor or failure	Below 50%
Average or passable	50- 65%
Above average	66- 74%
Exceptional, excellent	75-100%

Generally speaking, it is easier to first categorize assessments into these general terms of quality and then translate them into a percentage basis. Each percentage value has then a definite significance in which the standard of achievement was first expressed in general descriptive terms of quality.

In applying this basis of marking to the Clinical Record card, each instructor will have percentage marks for each student under the different headings for various observed operations or his personal qualifications. It is expected that every instructor shall make as many entries as possible during each semester of the clinical course.

The following are sample clinical record cards submitted by different examiners, showing the evaluation of clinical accomplishments for the same student:

Instructor A. CLINICAL RECORD CARD

Name John Doe *Chair No.* 12
Year Fourth Dental *Session* 1948-49

Date	Chart No.	Nature of Service	Professional Decorum 10	Inst. and Equip. 10	Planning and Practise 10	Knowledge and Skill 100
Jan. 6		Class II. inlay prep.				85
Jan. 10			8		6	
Jan. 20	3256	Finished chart (Inlays, bridge)				80
Feb. 1		Root Therapy (Canal filled)		10	8	85
Feb. 15		Consultation case	5	7	6	

FIGURE 2.

Instructor B. CLINICAL RECORD CARD

Name John Doe *Chair No.* 12
Year Fourth Dental *Session* 1948-49

Date	Chart No.	Nature of Service	Professional Decorum 10	Inst. and Equip. 10	Planning and Practise 10	Knowledge and Skill 100
Jan. 10		M-O-D inlay 6		7		70
Jan. 20					7	
Feb. 5			5			
Feb. 15		Porcelain jacket 1				85
Feb. 17		Prophylaxis		8		70

FIGURE 3.

At the end of each semester all the clinical record cards for each student are turned in by the clinical instructors to the Clinic Record Department. The marks for each student are entered on the student's master record card and a final percentage value is established, as illustrated.

In referring to the student's clinical summary card, the division of marking on a 10, 10, 10, and 100% basis is seen, and calls for further explanation. This plan is an arbitrary division in which an attempt is made to assess, not only the student's technical knowledge and skill, but also his personal and professional attributes. To serve this purpose it is felt that a fair weighting of marks would be to assign a maximum total of 30% to the three headings of professional decorum, instruments and equipment, planning and practice; and 70% to technical knowledge and skill.

The observation has been that examiners mark students more frequently under the headings of technical knowledge and skill than for any of the other factors. To facilitate the marking under this particular heading, the examiner bases his mark on 100%. This is later converted to a 70% basis on the student's summary card at the time of final evaluation.

The final mark for the student which is the total of all the averages under the four headings will actually be on a 100% basis.

At the end of the first semester, the clinical staff meets to consider the mid-term mark obtained by each student. Special consideration is given to those students whose marks are close to pass level or below. The reasons for their position are assessed and measures are adopted to help them improve their work. Following this, each student is interviewed by the director of the clinic. The student's qualifications, progress and grading are discussed, and he is informed as to how his work can be improved.

Instructor C. CLINICAL RECORD CARD

Name John Doe *Chair No.* 12
Year Fourth Dental *Session* 1948-49

Date	Chart No.	Nature of Service	Professional Decorum 10	Inst. and Equip. 10	Planning and Practise 10	Knowledge and Skill 100
Jan. 11		Class V. cavity prep. |3		10		90
Jan. 11		Gold foil |3				90
Feb. 6			9		7	
Feb. 24		Wax pattern |6		7		60
Mar. 5		Application of R. D.		6		70
Mar. 10		Completed chart amalgams, silicates				80

FIGURE 4.

During the second semester, weak students are interviewed periodically and their progress evaluated.

At the end of the course in clinical dentistry, the student's final mark for the year is established, from his record card. The students of the

SUMMARY OF STUDENT CLINICAL RECORD CARD

Student: John Doe

Year: Fourth Dental Year

Session: 1948 - 1949

Instructor	Professional Decorum 10	Inst. and Equipment 10	Planning and Practise 10	Technical Knowledge and Skill 100
A.	8	10	6	85
	5	7	8	80
			6	85
B.	5	7	7	70
		8		85
				70
C.	9	10	7	90
		7		90
		6		60
				70
				80
Total:	27	55	34	865
Averages:	$\frac{27}{4} = 6.7$	$\frac{55}{7} = 7.8$	$\frac{34}{5} = 6.8$	$\frac{865}{11} = 78.6$ Conversion to a 70% basis $78.6 \times \frac{7}{10} = 55.02$
Final Mark:	6.7 +	7.8 +	6.8 +	55.02 = 76.03%

Name John Doe Chair No. 12

class are arranged in order of merit, and at a clinical staff meeting their marks and standing are approved.

C. *Patient Selection, Diagnosis and Treatment Planning in Teaching Clinical Dentistry*

VIRGIL D. CHEYNE, D.D.S., Ph.D.,* *Seattle*

The fundamental principles of teaching examination and diagnosis in the dental curriculum is the thesis of this presentation. Only when they are thoughtfully and systematically pursued does the student gain a basis for scientific prognosis and treatment. Hine[7] has pointed out the inherent difficulties in attaining this objective by his examples which demonstrate that it is much simpler to teach a dental student *how* to give treatments than *when* to give or withhold them. "To create and maintain in the mouths of our patients, healthy and efficient masticatory function is of far-reaching benefit."[2] Consideration and intelligence must be exercised in each dental case before this ideal is attained.

By *examination*, in the biological sciences, we mean the inspection and tests applied to the circumstances, conditions, and accumulated data necessary to the ascertainment of truth. In dentistry it relates to the use of any procedure which will yield accurate information regarding a disease or state. By *diagnosis*, we mean the act or art of applying a critical evaluation or making a logical appraisal of signs, symptoms and other factors uncovered during examination. It includes a consideration of the causal factors of disease, a determination of its nature, and an estimate of the amount and kind of damage that has occurred. Included is the basic knowledge of normal, or health with all the deviations, as distinct from disease in the individual being examined.

The University of Washington, School of Dentistry, opened its doors to the teaching of clinical dentistry for the first time, this year (1949). Because the Department of Oral Diagnosis and Treatment Planning has been in operation only a short time, therefore, I will confine my remarks to the following topics: (1) Plans formulated prior to the opening of the department; (2) progress made and difficulties encountered in organizing a new school; and (3) future developmental lines which must be pursued in the interests of effective teaching.

A. *Preliminary Plans:* Opening a new dental school with personnel drawn from various parts of the country offers a rare opportunity

*University of Washington, School of Dentistry, Department of Oral Diagnosis and Treatment Planning.

Reference notes (1 to 10, inc.) on page 164.

often desired by experienced teachers to put into operation ideas and procedures unencumbered by precedent and tradition. Such were our desires at Washington where there never has been a dental school. Several months before we opened, many of the key men on the staff had been selected and they had in mind a general plan of operation. The three months immediately preceding operation we spent in faculty conferences where as nearly as possible exact departmental plans were drafted as would guide our activities for the first year, giving due consideration to physical relationships. We are now two-thirds through this trial-and-error period. The medical school, which is a part of the Division of the Health Sciences, still is not properly housed in its new quarters, and of course, remains quite loosely organized.

The staff of the dental school formulated plans for the Department of Oral Diagnosis and Treatment Planning which specified that the consideration of patients' dental conditions should be more than the usual precursory examination and routing to various departments. We realized that a common fault among dental schools is that a large portion of the curriculum is devoted to treatment, oftentimes empirical, with no definite program of teaching diagnosis. This deficiency was called to the attention of the teaching profession by the Curriculum Survey Committee of the American Association of Dental Schools[1] nearly fifteen years ago when it was stated, "It is generally recognized that the weakest link in dental education today is instruction in diagnosis and treatment planning," at which time it was designated as a major subject with suggestions outlined for presentation of a course. This followed the advice of the Dental Education Council of America some nine years previously that such a subject should be taught separately in the dental curriculum. It is remarkable how slow dental schools have been in heeding the advice, even though textbooks are now available on the subject and most of the periodical literature on treatment of cases carries important reference to diagnostic problems. In spite of this, however, nine out of twenty-five state licensing boards reporting in 1943 were including at least some phase of the subject.[3]

Unfortunately, the need for dentistry has concentrated our efforts in teaching treatment technics because of the high degree of mechanical skill required of dental practitioners and there has been little time left for the study of causative agents and preventive measures directly applicable to dental disease.

Since the turn of the century, the curriculum has been lengthened from three to six years, due to the growth of the biological concept,

so fundamental to the future of dental teaching and practice. But there still is difficulty in integrating the preclinical and basic science subjects with clinical teaching. This is aptly stated by the Curriculum Survey Committee[1] as follows: "Much effort is expended in teaching fundamental sciences to dental students, but the full benefit is not derived from these sciences, because they are not sufficiently applied to the study and treatment of cases."

Craig[6] emphasizes the transitional period between laboratory and clinic during the dental student's career as requiring special consideration. To some extent mastery of the situation has been effected by assigning teachers with broad training in both phases to cover the curriculum, but there still remains a vast amount of bridging to be done. In order to correlate many oral disorders with systemic conditions, it is necessary to call into service the biological sciences available. Likewise, it is now generally accepted by the professions of the healing arts as well as the public that teeth have some vital connection with the rest of the human body, wherein certain pathological conditions in one part may be only a symptom of the disease and not the disease itself. The overall objective in teaching, therefore, should be to train the student to look upon the mouth as a portion of the body to be restored to health and function. A Department of Oral Diagnosis and Treatment Planning in any dental school is in the most strategic position to teach many of these concepts to students. Zander[9] affects one phase of this correlation by teaching the students to check carefully the histological pictures of clinically normal teeth, of teeth which reacted abnormally to clinical tests, and of teeth which were filled under experimental conditions.

The teaching of oral diagnosis should be a cooperative affair in which all of the clinical departments collaborate. When the new school started, it was our aim to compose a general plan of treatment for all cases, giving a maximum amount of student instruction in the process. The bulk of these duties were to be shouldered by the Department of Oral Diagnosis and Treatment Planning, but the various other departments were to enter as consulting agencies when the need arose. We looked upon this latter phase as a pooling of opinions among specialists and had faith in the project, because of its interdigitating effect in behalf of the school. It was possible to be optimistic insofar as we were not yet burdened by unrelenting departmental autonomy.

It is well known that one learns by doing and it is necessary to give the student responsibilities. We felt that any plan which allowed the student first-hand contact with diagnosis, planning a case, and seeing

that the work was carried to completion was an excellent one. We tried to break with the fault of examining a mouth for a cavity to fill because some points were needed in inlay work and the tendency to make a hasty perusal of the mouth coupled with radical and overzealous action only to be followed by reaction. This does not stimulate the student to view the mouth as a coordinated whole wherein one type of restoration depends for its success on another or upon the conditions of the tissues or health of the patient. We realized his greater responsibility to the patient.

B. *Progress Report:* During the early months of operation the plans as outlined have materialized rapidly. The greatest factor upon which we base success has been the excellent cooperation offered by the various departments in contributing information. We know of no better way of accumulating data for teaching than having the student question his teachers about cases. After this it is the duty of the student to apply his mind to the mass of information and consolidate it into a comprehensible picture, capable of interpretation and classification. In order to assist the student in these so-called (1) recognition; (2) interpretation; and (3) decision factors,[3] each department now has representatives on call during the clinical hours.

It is neither necessary nor practical to require an exhaustive departmental consultation type of diagnosis and treatment plan for all patients entering the clinic. Simple problems or those which have been encountered routinely in other patients are approved by the Department. Only those deserving of exhaustive consideration with certain elements of special teaching value which can be more effectively presented by the treating departments are referred. When difficulties arise as to the most logical procedure to follow the question is settled by the representatives. In all instances the Department of Oral Diagnosis acts more in the capacity of arbitrator than advisor and would not expect a department to treat a case unless that department had been consulted previously on the plan. We try to keep our recommendations in the "opinion" category until they are approved by the treating department. Care is always exercised in preventing our activities from infringing upon or weakening the teaching in other areas. All cases which obviously will be considered complex are clarified with both patient and student that only a tentative diagnosis and treatment plan is being proposed, and unless agreement is reached regarding its suitability for teaching, inactivation or actual rejection may be in order. If a case is inactivated, it is then classified for special consultation to be held at a future meeting

of all departmental representatives concerned. The latter procedure we have not yet instigated, but the need is evident and we shall soon have it initiated. This will afford an excellent opportunity for panel discussions before members of the class, presenting them with the diverse considerations and alternate proposals which can arise in case planning. At present we are merely rejecting such cases until we become better organized.

We book prospective patients according to an appointment system, doing a preliminary screening over the telephone or by personal contact, according to their desires or chief complaints. We accept only on the basis of suitability for teaching, including cases which incorporate fundamental rather than unusual or rare conditions. Any person may apply for admission, but our judgment regarding final acceptance is based not only on the condition of the mouth, but upon age, sex, occupation, availability and appreciation for dental service. We believe the matter of selecting patients is one of the most important phases of clinical management, and we deliberately try to select individuals who will be similar to those normally seeking treatment in dental offices and upon whom the average dentist depends for a stable practice. Many future complications and loss of valuable teaching time are avoided at this point by refusing treatment to a large number of persons who present themselves. Fortunately we are situated in a large city and have the opportunity to select and build a very desirable clientele from a large number of applicants. Many indigent cases come because of reduced fees, but we do not allow this to influence our judgment. As a result we are confronted with the task of keeping rejected patients pleased, but this is not difficult if time is spent in explaining why a case is not suitable for teaching.

Students are assigned to the Department of Oral Diagnosis in block units and they have the opportunity to receive and inspect all patients. They also have a part in the acceptance or rejection procedures. They discuss dental problems with the applicants, while the instructor remains in the background to approve or disapprove of the analysis and judgment rendered. Before and after acceptance and during the formulation of the plan of treatment, the instructor acts more as consultant, councilor, and coordinator. Suggestions and help are always available when and if needed. He encourages and compliments the student, minimizing or preventing critical mistakes, thus inspiring confidence, especially when reasoning involves an understanding of fundamental principles, until after a time the student learns to approach his patients with a minimum

of timidity and a maximum of proficiency and professional bearing. These responsibilities develop the following attributes outlined by McGehee:[8] "The prime requisites to success as a diagnostician are exact knowledge, intuition or imagination, appreciation of values and proportions, ability to make comparisons, genius for minutiae, power of close and accurate observation, cool and impartial judgment, and logical reasoning powers."

Once a patient is accepted for treatment as much time as will be necessary to completely and adequately consider all details is reserved. The patients are informed during registration that they are required to subject themselves to an extensive examination and diagnosis for their own benefit and the teaching principles involved. The patient is then ready to be "processed." This is initiated by a detailed visual and digital examination of all oral structures. A brief history of systemic conditions is obtained. No attempt is made to teach the dental student to be a medical diagnostician, but pertinent findings which might necessitate a reference are sought. After this the case goes to the Section on Radiodontics, which is a logical part of diagnosis,[8] and a full mouth survey supplemented by bite-wing radiographs or other pictures which are necessary are taken in all cases. The students take the pictures themselves and do the developing under the supervision of a full-time dental radiologist. When the exposures are completed and mounted they are read with the student. We try to deviate the student from the fascination of locating concealed conditions with the roentgenogram entirely, which has resulted in a tendency to ignore the importance of making a meticulous clinical examination of the tissues of the mouth. The clinical and roentgenographic examinations must be closely correlated for greatest accuracy.[5] If there seems to be serious systemic implications the patient is referred to his family physician or to the medical branch of the university. At this point we have sufficient data to formulate preliminary indications for treatment.

Even the most carefully planned dental cases will have certain unpredictable alterations arise during the execution of treatment, such as pulp exposures. Whenever possible such contingencies are taken into account during the initial examination and planning, but if the deviations occur during treatment and the student assigned to the case needs further assistance in diagnosis, he returns to our department. If it is a simple problem the treating department works with the student or the other departments which might be immediately concerned.

By following all of the steps in planning through to logical completion

the case is placed on reserve and the outside of the folder is marked with a special color code designating the treating departments in the order in which the case will be handled. On the first inside page the type and number of operations to be performed are tentatively outlined. Later we shall devise an *Assignment Sheet* similar to that proposed by Craig[6] and followed at the University of California. Occasionally the student who has planned the case will accept it, but more often another student takes over according to his immediate clinical needs. The Department injects itself here by judiciously supervising the assignment of cases, taking into account personality differences, unit requirements, and stage of advancement of the student. It makes little difference whether a shift is or is not affected because all students alternate through the Department and thus gain quite similar experience.

Each student exercises considerable prerogative in the selection of cases, but once he accepts one he must carry as many operations to completion as possible. Such an arrangement has a variety of advantages. The assumption of this responsibility under direction is comparable with, and prepares the student for, a similar but greater responsibility of attaining methods for pleasing his patients and gaining their confidence in his future practice. The unit or point requirements are sufficiently flexible to allow leeway in these regards. We encourage the student to build a personal infirmary practice with patients referred to him by other patients for whom he has done a satisfactory service. In this way the student will be evaluated as much by his patients as by the instructors. Any patient who expresses a desire for the services of a certain student may be assigned, if the student designated can budget his time and adjust his requirements according to the presented needs. Likewise, students may have certain patients admitted for treatment as long as they personally administer the treatment or if such be needed by other students or departments.

When the patient is assigned for treatment, the departments concerned briefly review the case with the student. Before the various recommendations are performed the details are more carefully considered on the departmental sheet. This prevents the treating department from accepting the indications made by the Oral Diagnosis Department verbatim and allows further thought, emphasizing the etiology and nature underlying the disease being treated. While it is true that a certain amount of duplication results, this is beneficial in improving instruction by emphasis.

We offer courses on office economics in the school, but the clinical records in use, including the method of quoting fees to patients, offers

the students personal experience which will be of assistance later to them. We have tried to devise chart forms sufficiently comprehensive for teaching yet simple enough to give the student concrete examples. The fee schedule set by the university is above that of most dental schools, but it still is not comparable to private practice. This is constantly reiterated to the student, so that he will not gain a misconception of necessary office costs and fees. The Department of Oral Diagnosis tries to give the patient a general estimate, but the student assigned to the case discusses the details as treatment progresses. He has no authority to collect fees for the school on the basis of his quotation, but his assistance in keeping the patient informed is appreciated by the departments and is of considerable training value to him.

All of the material pertaining to the patient is kept within the confines of one folder, divided according to departments. This folder stays with the patient at all times. It presents a unified and comprehensive report of all departmental consultations, treatments, and laboratory reports. The admitting portion of our department constructs the original folder and adds the necessary material. It also serves as the central filing agency for the dental school. We release charts during the course of treatment to students or departments and all transferring of patients must be done through us. We assist the student in handling broken appointments and recall the chart when the case is completed or inactivated. Each patient, who is inactivated as a result of dissatisfaction, inability to keep appointments, moving or the many other common reasons, is contacted prior to inactivation if possible. The proper notes are made concerning disposal and the student is given commensurate credit if there is unfinished work. To date we have not received patients for reappraisal of their oral conditions after previous completion, but a method will soon be devised and will comprise an important phase of student instruction. The Department of Oral Surgery and Pedodontics, which operate on the block system, are responsible for their patients' charts and appointments. The Oral Surgery Department functions as a service center to handle the reference of patients from other departments. Pedodontics operates quite independently because of their special problems in caring for the child and the fact that they are physically separated from the main operatory. We would like to assign child patients to students for complete service, but the inconveniences encountered in moving for each appointment do not compensate for the advantages involved.

Usually the initial dental service is a thorough prophylaxis unless an

emergency condition exists which must be satisfied first. This is done under the supervision of the Department of Periodontology, coincident with instruction and education in the home care of the mouth. Necessary extractions are handled next in the sequence of treatment or, if the student believes that he can budget his time better by delaying surgery this contingency can be altered, but we like to see cases put in hygienic condition by prophylaxis with eradication of alveolar infection and the removal of infected teeth as early as possible before constructive treatment. The case is then cleared for operative dentistry. Endodontia, correction of traumatic occlusion, crowns and bridges, and partial or full dentures are then undertaken as joint projects while the patient is receiving restorations. With such a plan of so-called free operation the student can carry many patients simultaneously in several departments, alternating procedures according to a schedule between clinic, laboratory, and availability of his patients. The student is given the responsibility of budgeting his own time and thus learns his maximum efficiency.

Whereas the objective of diagnosis is rendering proper treatment, fixed- and removable-partial design or the type of a tooth restoration does not constitute major factors in recommendations. We merely decide, for example, that a crown is indicated, planning on the basis of whether or not such an operation can best serve the interests of the case. We indicate various types of operations or filling materials in the plan, but the ultimate decision is dependent upon the student or department.

C. *Contemplated Developments:* As yet we do not have a procedure for guaranteeing complete care for the patient, but this does not seem to offer much of a problem. We make it possible for a student to transfer a case, but since our opening many cases have been carried to successful completion by the same student.

There is no doubt that a diversified and adequate distribution of clinical work among students is mandatory, coordinated with a carefully designed system of patient assignment, giving the student general experience in the various clinical divisions, but one of the first tasks confronting us prior to operation was to decide upon the amount of time each department would receive out of the total available clinical hours established by the Council on Dental Education. This was done so that no divisional head could harbor the opinion that his department engaged in a more important branch of teaching than another and thus attempt to usurp the student's time. We attempted to plot the number of operations the students are able to perform in the time designated, but rigid requirements are not yet in effect. The criteria for advancement is

acceptability of quality and quantity of work performed in single departments. We realize this present arbitrary standard has a disadvantage for the student who feels insecure regarding his progress, but we constantly encourage efficient budgeting of time and striving for self-improvement in various operations. Eventually, of course, we will hold a certain minimal number of completion units, but during our developmental period, this can not be too rigid. There are other ways of gaining a dental education than that of fulfilling isolated unit requirements, and if we finally reach only a middle-of-the-road attitude in this regard, it may prove to be sufficient. We are more interested in turning out a student who is a capable operator, appreciates the health requirements of a case both orally and systemically, and comes to look upon his patients as individuals rather than as isolated credit requirements.

Program of Instruction

The courses in Oral Diagnosis are taught during two quarters of the Junior year, one hour each week, and one hour each week during the entire Senior year. This comprises fifty hours of class-room instruction, specifically designed to tie in and supplement the clinical phases, which comprise an additional forty hours for the two years. The class instruction is the means of explaining the principles and methods involved, while the clinic serves as a laboratory in which to practice. In addition, the Department has charge of the course in Oral Pathology taught to Juniors, for which thirty hours have been set aside for lecture and laboratory periods. The material has been found to be inseparable from many phases of the Oral Diagnosis courses. We, therefore, look upon the course as an excellent corollary, teaching the characterization of specific pathological conditions supplemented by the histological features. Whenever possible the case history method of teaching is employed in all the courses. In oral pathology a large portion of the time is spent in correlating the microslides on a case with the clinical, roentgenological and other findings. Supplemental reading from standard text books and recent articles on the subject are covered by assignment and class discussion, but it has been found that retention in learning is most successful if concrete examples are used, particularly if they are visual or can be studied in the clinic. One cannot learn to recognize obscure lesions on the sole basis of book knowledge.[4] We have in mind to make colored moulages of interesting cases according to the technic perfected by Ziskin.[10] This will offer the opportunity of observing a larger number and assortment of cases than normally present themselves during the time the student spends in the clinic.

During the two years we try to cover a systematic outline of oral diagnosis which will provide the basis for determining and administering rational treatment. At the beginning and throughout, discriminative observation, close perception and apperception, accurate judgment, logical reasoning are all habits which we try to inculcate in the student in order to arrive at sane conclusions. Hine[7] refers to these as *techniques*, drawing an analogy between the context to that of other courses in the curriculum. The management of patients and the sequence of taking case histories opens the course. The laboratory tests which can be performed by the dentist are discussed in detail, including radiology, the value of saliva and pulp vitality tests, transillumination, smears and recourse to microscopical inspection of tissue through biopsy. The relationship between dentist and physician are discussed. The examinations which can be performed by the physician are mentioned, including an interpretation of the returned findings as they apply to a dental case. The benefits and errors incident to medical-dental consultations are pointed out, emphasizing the need for understanding and collective approach to problems concerned with the patient's health. Later we hope to appoint a physician to give a series of lectures to our students on the subject of medical diagnosis. When the medical school becomes better organized we shall be able to utilize it for tests and assistance in systemic diagnosis. The relationship of physical facilities which have been planned are designed for maximum efficiency for such exchange of personnel and

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assistance. When all this is completed and the Department of Oral Diagnosis has an opportunity to become proficient in its present line of endeavor we know the dental student will be refreshed in his basic science subjects from various sources, and he will become a qualified dentist capable of studying each of his patients in thorough detail, practicing intelligently all the phases of our profession which so proudly makes it one of the leading health sciences.

2. OPERATIVE DENTISTRY

A. *Preparation of the Student for State Board Examinations in Clinical Operative Dentistry*

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The problems of a dental student during his college career are many. Some are minor, others are major, their importance varying with the circumstances of the individual student. With some it may be a matter of adjustment to a completely new environment. The predental years are partially designed to act as a conversion period from high school habits to college procedures. To some degree these years prepare the student for his dental training. Nevertheless, the change over from an essentially academic curriculum to a purely professional course is often fraught with difficulties. The thought uppermost in the mind of the undergraduate is the satisfactory completion of the school's requirements for graduation.

The next important aim on the part of the dental graduate is the successful passing of the dental board examination in the state in which he chooses to practice.

Theoretically, at least, his success in this task should be assured if he has satisfied his dental teachers that he is qualified to practice dentistry. A study of the records will reveal that this is not always the case. Those participating in dental teaching know that at times graduates of our schools fail to pass the examinations even in the state where the college is located. At times this even occurs with our so-called, better students. These conditions should be rare indeed if we, as faculty members, have fully discharged our duties to our students and state board examinations have been conducted according to the trends of present-day dental education.

It is not the purpose of this paper in any way to criticize state dental boards, but rather to discuss ways and means of preparing graduates of

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dental schools to pass their examinations creditably. The discussion will be limited primarily to the field of Clinical Operative Dentistry, although some of the general principles may be applicable to other branches of dentistry.

The question has often been raised as to whether or not dental teachers should "coach" their students for board examinations during the college course. Strictly speaking, this should not be necessary, for if a student has been adequately prepared in dental college, for the practice of dentistry, he should experience no difficulty with the state examination. There are, however, certain considerations which must be borne in mind regarding this problem. The examination presents conditions of pressure and apprehension which are peculiar to itself and do not necessarily occur in the ordinary practice of dentistry. This the faculty should take into account and endeavor to prepare the graduate to meet such conditions during his undergraduate days. A further discussion of this situation will be given in subsequent paragraphs.

Under the present system it is understandable that students graduating from colleges in one section of the country may have difficulty in passing dental board examinations in other parts of the country, owing to variations in standards, technics and procedures. For example, some schools do not stress the use of gold foil as a filling material. It is possible that the dental boards in the states in which these schools exist, do not require the placement of gold foil restorations as a part of their examination. The graduate of such a school is ill-fitted to pass an examination by a board which requires a gold foil filling. In other instances it has been stated that schools spend much time teaching the use of gold foil principally for the purpose of preparing the graduate to pass the state examination. This, the author feels, is not justifiable, for if the use of gold foil is to be taught in the dental curriculum it should be because gold foil, as a filling material, lends itself well to teaching procedures or is a restorative material of superior merit.

These conditions lead to certain conclusions: (1) A standardization of techniques taught in dental schools throughout the country is indicated; (2) close correlation between the schools and the dental boards is in order. In recent years much has been accomplished in this respect through the efforts of the Council on Dental Education, working to integrate the curricula of the dental colleges in the United States and Canada. Also the work of the National Board of Dental Examiners may be an aid in developing more uniform standards in dental examinations. The examinations which they offer are accepted by one-half of the states.

In the field of Clinical Operative Dentistry the student's training for board examinations begins simultaneously with his preparation for the practice of dentistry, in that the successful passing of the board should indicate ability to practice dentistry. Such training requires not only an excellence in technical skill, but a thorough correlation of these technical skills with the pre-clinical sciences. The student must have a thorough training in tooth morphology if he is to achieve correct functional and anatomical form in his clinical restorations. Furthermore, a knowledge of pulp position will be an aid in preventing damage to that organ. He should be familiar with the best obtainable information regarding caries processes, to better enable him to understand the principles underlying the eradication of decay and the extension of cavities to reasonably immune areas, thus minimizing further caries. The application of training in physiology, histology, pathology, biochemistry and therapeutics to the field of clinical practice will do much to keep these subjects fresh in the mind of the dentist during both his graduate and undergraduate days. Possibly by full utilization of this principle many failures in state dental examinations could be avoided, for as Wilson[2] states: "Many states give partial examinations at the completion of two years of these subjects to be sure that enough is retained to pass an examination. The subjects in which the graduate fails most often after a few years are biochemistry, bacteriology, physiology, pathology and materia medica. Memory is partly accountable; so is lack of practical application."

To obtain information regarding the requirements of the various state boards, a questionnaire was sent to 49 dental state board secretaries in the United States. Forty-three responded, which was most gratifying. The material contained in their replies was of great value in the formulation of this paper.

A survey of the requirements, with the degree of importance attached to clinical operative dentistry, indicates that this branch of dentistry ranks high in the minds of board members. The question was asked, "What weight is placed upon the Clinical Operative Examination in the Overall Grade?" The answers ranged from 25 per cent to 75 per cent. Some answering this question specified their answer applied to operative only, others to operative and prosthetic procedures combined; the remainder did not specify. Eight per cent of the answers stated that 50 per cent or greater value was placed on clinical grades. A careful analysis of the answers leads to the conclusion that the majority of the boards place considerably more importance upon clinical grades than theoretical,

[2] *J.A.D.A.*, 38, 99-107; 1949 (Jan.).

with many of the boards stating that failure to pass the operative examination means failure to pass the entire board. This need not in any way minimize the value of the basic sciences, but rather leads to the conclusion that the ultimate in the practice of dentistry requires the application of the theoretical subjects to their fullest extent.

Answers to the question regarding type of filling material and classification of cavity used as test material, vary considerably. The fillings include Class I, II, III, IV or V Gold Foil; Class II, IV or MOD Inlay; Class II or MOD Amalgams and Class III Silicate. Most boards require combinations of at least two of these types of restorations, with the greater number specifying a proximal gold foil and a two surface amalgam filling. Of those responding, four states eliminate the foil and use either the Inlay-Amalgam or the Amalgam and Silicate combination. Sixteen boards specify the Class III Gold Foil, three the Class II Foil and seventeen allow a choice of cavity classification for foil. The majority of boards using inlays as a part of the requirement, specify a two or three surface cavity.

Many of the state boards retain the privilege of specifying the type of restorations to be placed at the time of the examination, although within reasonable limitations. This is understandable in that circumstances or conditions may tend to dictate the policy, and justifiable in that the applicant should be prepared to place any type of needed restoration, time permitting, if he is qualified to practice dentistry. In view of these variations in requirements it may be concluded that it is not wise to attempt in the school to coach the student for any particular type or class of restoration but rather to train him in the fundamentals of cavity preparation, the placement of the indicated type of filling material and the proper finishing of that restoration.

This is further borne out by the answer of the boards to the question: "Does your board require some particular technique or is any standard technique acceptable?" The great majority of answers declared that any standard technique, which demonstrated sound principles, was acceptable. A few of the answers indicated that Black's principles were preferred but not necessarily required.

As teachers, how may we best train our students to meet these situations? Time does not permit an answer in full detail. Briefly, however, it may be stated that the student must be thoroughly trained, from the beginning of his operative course, in the fundamentals of cavity preparation, the reasons underlying these fundamentals and the method of applying them practically. It has been the policy in many schools to turn

over the pre-clinical laboratory course in operative dentistry to the young and untrained instructors, with the thought in mind that the highly trained instructors can, in the clinics, make "finished" operators of the students. This, the writer believes, is a fallacy, for it is during the early training of the student that his operating habits are formed. During this period his lessons must be most carefully and correctly learned, in order that he may not have to unlearn incorrect procedures as he progresses into clinical practice. It would be well, then, to have the laboratory courses under the leadership of well trained and qualified instructors. They at their discretion, may avail themselves of the aid of a limited number of young teachers, who in turn will profit by their association with those more highly trained. It would also seem advisable that the majority of clinical and laboratory instructors divide their time between the two fields in order that the teaching may be more uniform and standard.

Another important point for consideration is that of developing the student's judgment in the handling of various situations. Too often in our attempts to teach the "ideal," we overlook the variations from the "ideal," with the result that when the student is faced with a practical problem, not covered in his ideal teaching, he is at a loss to know correct procedure.

This situation may be responsible for the failure of a student in his clinical board examination and most certainly such a student is not ready to practice dentistry. It is the teachers' responsibility to analyze each student carefully, determine his capacity, and attempt to develop it to such an extent, that when faced with unusual situations he will have sufficient judgment to adequately care for the problem at hand.

One satisfactory means of developing this judgment and determining the student's ability is the practical test case. This implement may be employed early in the operative technics course, and its use continued at intervals until graduation. The test case is not designed for instruction in technique and the instructor should not interfere or instruct during the test case, except when necessary for patient protection. The combined comments and criticisms of the examiners should be given to the student following completion of the examination. By this method the student is thrown upon his own responsibility and has the opportunity to develop and demonstrate his ability and judgment. Upon graduation he is better able to cope with unusual conditions, and is not only better prepared to handle problems presented by the state board, but is eminently better qualified for the practice of dentistry.

The tests given the student early in his clinical career should be of a comparatively simple nature; for example, the first might be a Class I or V Amalgam restoration. As the operator develops in skill, judgment and experience, the type of filling may be varied to fit his abilities and eventually, should include such restorations as the proximal gold foil filling and the two or three surface inlay. Each student should be observed by at least two examiners in each test. In order to accustom the student to working under varying conditions, the examining staff should be rotated for each test. This will prevent any tendency of the student to coach himself for the desires of specific instructors.

Another important feature of the test case is the development within the operator of a degree of self-confidence, unattainable by other means. Through repeated tests, whether passing or failing, in which he must rely upon his previously learned knowledge of correct procedures and the use of his own powers of deduction to meet new situations, the student will gain self-assurance, which will be of great value to him during the state board examinations. In this way, so called state board "jitters" may often be avoided.

The question, "On what do you grade in Clinical Operative Dentistry?" was submitted to the boards. The answers to this question also showed considerable variation. In general, however, they included such considerations as operator's diagnostic ability, his appearance, professional behavior, cleanliness, chair position, use of rubber dam, removal of caries, cavity outline, cavity preparation, adjustment of matrix, manipulation of filling material, casting technique, finishing of filling, checking of occlusion and contact. The degree of importance of each step varied with different boards. The answers do indicate, however, that all phases of operative ability are observed and carefully weighed in the evaluation of the candidate. In view of this fact, the dental faculty must not only teach technical skill, but should endeavor to inculcate in the student the ability to consider his patients' dental needs as a unit. The student has a tendency to look for individual cavities present in a mouth and not be aware of the overall dental needs of a patient. This failing must be avoided by the use of a definite plan of procedure in examination and diagnosis of each individual case.

The question was not asked as to whether or not mouth examinations and diagnosis were a part of the clinical operative test. However, the need for training in this phase of clinical dentistry is shown by the fact that thirteen of the boards stated, as incidental information, that a mouth examination with charting of cavities was required. Six of these

require the use of roentgenograms as well as visual examination. In fact, certain of the state boards do not specify the type of restorations to be placed until this diagnosis has been completed. At this time the most needed restorations are specified as the test operations. This plan has sound reasoning behind it, in that such a procedure should be followed by the dentist in practice. The student should be taught, in making his mouth examination, to evaluate the entire dental needs of his patient and to ascertain which conditions are in need of immediate attention. Restorations should be placed in the order of their importance. Practical experience, however, has shown us that this plan is not always followed. Clinical requirements which are placed upon the student by the college for certain types of restorations often tend to cause the student to overlook the more serious cavities in favor of the cavity which may be filled with the type of restoration which he needs for his clinical experience requirement. In teaching it becomes necessary then, to place particular emphasis upon the order of importance of cavities to be filled. This may be done by having the student, at the completion of his examination, under the guidance of his instructor, number the cavities to be filled according to the order of their need for placement.

Often it may be necessary to have the student remove the caries from these deep cavities according to the order numbered, and place cement fillings until such time as the permanent restorations may be placed. The student and patient will not lose time in the overall picture for if the cavity is checked for caries removal before the cement filling is placed, the deeper portions of cement may remain in place, as a base for the permanent restoration. If the student is well trained in this procedure and made to realize its value he will conduct his practice along similar lines, which will be advantageous to himself and his patients.

This must be taken into consideration in evaluating the student's clinical experience when this system is used, for the student's first duty to his patient is the care of that patient's most immediate needs. If in treating deep seated cavities by removal of caries and placement of cement fillings, the student's experience becomes temporarily unbalanced, he should not be penalized for not meeting his overall requirement. As previously stated this condition will tend to correct itself as the permanent type of restorations are placed.

Appearance, cleanliness, and professional behavior of the operator are not only considered by the state boards, but are carefully considered by his patients. It therefore becomes necessary to stress these points in teaching our students, from their earliest clinical experiences until

graduation. These features may be taught by example, by lecture, and by individual contact and inspection.

The importance of correct chair position cannot be overemphasized. Its principles should be taught before the student enters upon his clinical practice. The use of sound principles along this line may mean the difference between success and failure in practice. Incorrect chair position is not only uncomfortable to the patient, but may seriously jeopardize the health of the operator. Furthermore, it is impossible for him to work at maximum efficiency when incorrect positions are used. This factor becomes of utmost importance when the student is taking an examination such as the state board, at which time he is already working under unusual stress and strain.

The use of the rubber dam is a necessity for the proper placement of a gold foil restoration. Its use, however, should not be limited to the placement of foil fillings. A full discussion of the rubber dam, indications for its use and methods of application, is not indicated here. However, certain factors pertinent to its use may be of interest to dental instructors. The student should not only be taught how to apply the dam; but why to apply it, how to overcome objections to its application both on part of patient and operator, and the many benefits which will accrue to both, if used where indicated.

Many of the boards also emphasize in their examinations, the testing of the applicant's principles of pulp protection and tooth conservation. Seven of the boards specifically mention grading on pulp capping ability and placement of cement base, although this question was not directly asked. In general the greater percentage of the grade seems to be allotted to cavity preparation, rather than to insertion or finish of filling, although a few boards mention equal values for each part.

The question of cavity outline also holds a prominent position in the grading of the operator's ability. This is closely related to the question of caries removal. Seventy-five per cent of the boards require completion of cavity outline before the operator submits his case for cement base check. This figure will be of interest to those schools which do not necessarily require that a student complete his cavity outline before requesting a cement base check, for whether they agree or not with the principle involved, it would seem advisable that their students be made aware of the comparatively large number of boards holding to this requirement.

The boards did not make definite statements regarding types of cavity outlines preferred, as this question was not specifically asked. It may

be assumed, however, from the answers received to other questions and the general emphasis placed upon Black's procedures by some of the boards, that principles laid down by Dr. G. V. Black for outline and cavity preparation in general, would be acceptable to most, if not all state boards.

In discussing cavity preparation, insertion of fillings, and finishing of restorations, some of the boards stressed critical examination of the instruments and the method of their use. Also, the abuse of separators was condemned. Care and proper use of instruments and separators should be taught our students throughout the dental course. The importance of a definite system of instrumentation, and in fact all procedures in cavity preparation, insertion and finishing of fillings cannot be overemphasized. Not only can much time be saved by the use of such a system, but work will be more efficiently done and the end result will be far more satisfactory. Thus the operator will be better prepared for his state board examination and will practice better dentistry with less effort.

The problem of analyzing the answers to the questionnaire sent to the state boards of dental examiners has proved difficult, in that the questions asked were general in nature and the answers therefore not always specific. This type of question was used, in order that those answering need not be overburdened with detailed answers. It is because of this fact that specific figures have not always been given, but general trends have been mentioned. Those answering the questions have perhaps placed slightly different interpretations upon certain questions. It is felt that because of this fact much general information of interest has been obtained, which might otherwise have been overlooked. Had time permitted, the writer would have wished to send questionnaires to the operative divisions of the various schools, asking what information they would have desired from the state boards. In that way much more valuable material might have been secured.

The question has been asked as to whether dental schools are obligated to conform their teaching to state board requirements or should state boards feel obligated to conform to the teachings of the dental schools. If the school carried its full responsibility to the students, the dental profession and the public, it must certainly prepare its students to pass the state examination. Also, if the board in its turn meets its full responsibility, it must examine the student in all phases of the science of dentistry regardless of the teachings which he has received in college. Discrepancies between the two may be avoided by frequent interchange of policies and procedures between the board and the schools. The

schools should make a practice of sending copies of their various examination questions to the boards. They should keep the boards informed of changes in technical procedures and teaching in the school. Likewise the boards might well keep the colleges informed regarding their desires for the student's training. The boards might also send critical analyses of the work of the candidate examined, to the school from which he graduated in order that the school may learn of its shortcomings.

The foregoing suggestions are primarily applicable to the schools and state boards located within the same state or neighboring states. This general plan, however, may be applied to schools and boards throughout the country. The machinery for this has already been established. The group of organizations working toward the fulfillment of such a plan consists of The American Association of Dental Examiners, The Council on Dental Education, The American Association of Dental Schools and The National Board of Dental Examiners. These organizations have done, and are doing excellent work in correlating and advancing the field of dental education and dental examining. However, further work and greater exchange of ideas between these groups should result in specific knowledge which will be an aid to the colleges and boards throughout the country, and should bring about a more unified program of dental education and examination, which will benefit the dental student as well as the profession at large.

Summary

1. The graduate of a recognized dental school in the United States should be capable of practicing dentistry and therefore capable of passing any state board examination.

2. Success in the field of clinical operative dentistry requires not only a high degree of technical skill, but must embody the careful application of the knowledge obtained from the pre-clinical sciences.

3. The results of a questionnaire sent to state boards throughout the country indicate that from 25 per cent to 75 per cent weight is attached to the clinical operative examination in the overall grading of candidates.

4. The great majority of the boards require a gold foil and an amalgam restoration as part of the examination. Many of the boards reserve the right to specify the type of restoration at the time of the examination.

5. All boards answering the questionnaire stated that any standard technique in operative procedure would be acceptable, although a few stated their preferences.

6. In teaching the student the fundamentals of cavity preparation, it is

well not to overlook the development of his judgment in handling the unusual situations which may arise. The clinical test case may be a valuable instrument in accomplishing this end.

7. Evaluation of the candidate's ability in clinical operative dentistry is not limited to judgment of his technical skill, but includes broad analysis of his general professional qualifications.

8. Particular emphasis is placed by many boards on the operator's diagnostic ability, and on the importance of considering overall needs of the patient. This fact should be stressed by the dental faculty, and the student must be allowed sufficient leeway in his college requirements to adequately care for his patients' needs.

9. Correct principles of cavity preparation, including caries removal, pulp protection and outline form are considered highly important by the boards.

10. Systematized instrumentation in cavity preparation, insertion and finishing of restorations will be of definite value to the operator in college, during the state board examination and in practice.

11. Close cooperation between the schools, the state boards and the dental profession is necessary to promote a more unified teaching program, a more universal examining procedure and a better qualified practicing profession.

B. *Discussion*

W. L. WYLIE, D.D.S.,[1] *Cleveland*

Dr. Rule, in the paper which he has just presented, has made innumerable suggestions which might well constitute the basis for an ideal program for the successful practice of clinical operative dentistry. It should likewise provide some positive assurance of ability to meet the requirements of a state board examination. As has been pointed out, however, it is not always those who manifest the best grasp of the complexity of clinical problems in school who make the most creditable showing when they are brought face to face with the trying situations of state board time. Frequently those with the best clinical records will surprise us with an unsatisfactory outcome in their test for license to practice while others with less ability will get through with no apparent difficulty.

The explanation for the failure of candidates of recognized ability in all probability lies in a disturbed mental state prompted by a new and

[1]Dean, Western Reserve University, College of Dentistry.

trying experience on which so much depends for the individual taking the examination. This, Dr. Rule refers to as State Board "jitters." To the end that this unhappy experience may be the lot of the fewest possible students, it appears to me that some means of coaching them for the state board examination is quite in order.

For many years it has been our custom at Western Reserve in both clinical operative dentistry and in prosthetics to hold a "mock board" examination near the close of the senior year on which students carry through to completion all clinical and technical requirements of the State Board of Dental Examiners. Those who are to participate in this examination are warned in advance of the bearing which neatness and cleanliness and orderly arrangement of instruments will have on a passing mark. They are acquainted with the routine procedure of the Ohio State Board and told that the "mock board" will conform in detail to time and clinical requirements of the Board. Students are put on their own and are graded on all aspects of their performance. Cavity preparations together with the various steps in placing and finishing restorations are given detailed consideration in determining the candidate's ability to cope with difficulties under time limitations and on his own responsibility. In the prosthetic aspect of the examination a full denture set-up is carried through, conforming in all details to that required by the State Board of Examiners.

In general we have found the "mock board" plan of coaching very helpful to the student when he faces the crucial test for his license to practice. It has given him a working acquaintance with state board routine and raised the level of his confidence. His attention has been called to his errors on the "mock board" trial and he profits from the criticism. The whole experience seems to relieve in advance that tension which is likely to lay hold of one confronted with an entirely new situation. I would not, however, want to give the false impression that we are one hundred per cent successful in our efforts to get our graduates by the Board. Statistics, in some years none too encouraging, are too readily available to you for me to prompt any such illusions. Our boys continue to have the "jitters" in spite of all precautions. It is our feeling, however, that the "mock board" serves to keep that number to a minimum.

There are other factors contributing to state board failures other than the "jitters." Very often an able candidate is handicapped by a poor selection of clinical cases, due either to lack of foresight on his part or to the difficulty of finding patients requiring the particular restorations demanded by the State Board. This latter situation is likely to prevail

particularly in the case of a candidate taking the examination in a strange clinic under unfamiliar conditions.

Then, too, there is the occasional individual who has believed all through school that requirements prevailing in this prescribed training period are just so many hurdles to be overcome before getting into practice. To him the rubber dam will become a memory, decay will be left in a tooth without bad consequences, extension for prevention will no longer be necessary and restorations will stay in teeth without occlusal retention. Such an individual is likely to try to "trade horses while crossing the stream" and is pretty sure to be sunk.

It is my personal feeling that state boards in general place too much emphasis on the importance of the gold foil restoration as a means of determining the fitness of a candidate for license to practice. It would seem that the cast gold inlay furnishes better evidence as to one's qualifications in this respect. The inlay calls for an exacting preparation, requiring a demonstration of the candidate's ability to sharpen and use his cutting instruments. It provides an opportunity to observe his appreciation of extension for prevention, the importance he attaches to the health of the interproximal tissue, the preservation of the pulp, and his knowledge of histology and dental anatomy. It is a test of his skill with wax and cement and of his acquaintance with the various steps associated with the casting process.

In general I am in hearty accord with the ideas expressed by Dr. Rule and I commend him for the excellence of his paper.

C. *Discussion*

A. B. GABEL, D.D.S.,[1] *Philadelphia*

Dr. Rule has covered the subject of the preparation of the student for State Board Examination in clinical operative dentistry thoroughly and well; in fact, so much so that there remains little more to be said. He has made a number of good points of which I would like to discuss several.

He has pointed out what he believes to be the fallacy of using highly trained instructors as clinical teachers while untrained instructors are assigned to technics. I am in complete accord with Dr. Rule for the same reasons that he states, namely that the students should be taught proper procedures and habits in the very beginning so that they may have nothing to unlearn.

[1]Department of Operative Dentistry, University of Pennsylvania, College of Dentistry.

There are also other angles to this. It is my opinion that the students would take more interest in and be more enthusiastic about the technic courses under experienced and well qualified teachers than under the supervision of young inexperienced instructors. There is also the matter of the more experienced teacher being able to orient the student and to point out to him the application of his technic training to clinical practice. These students would naturally be expected to require less instruction and supervision once they reach the clinic.

It is unquestionably desirable to have clinical and technic instructors divide their time between the two fields, though it is my opinion that this is not absolutely essential for uniform teaching as far as technical procedures are concerned. It is, however, highly desirable that the technic teachers see the results of their technic teaching as applied in the clinic. Only by this first-hand knowledge can they modify their instruction so as to get the best results.

Dr. Rule states that "another important point for consideration is that of developing the student's judgment in the handling of various situations." This is perhaps the most important aspect of all teaching and is what distinguishes the truly professional man from the technician. It seems to me that there has been entirely too much emphasis on the word "ideal" or "standard." There appears to be no such thing in nature but rather a variation which, within limits, may be considered normal and beyond these limits abnormal or pathological. This being the case it would appear that our efforts should be directed to teaching principles and their application in the planning of our treatment and the design of our restorations rather than detailed procedures.

This is not to say that detailed procedures have no place at all in dental teaching but merely to express the feeling that they are, relatively, much over emphasized. Detailed technical procedures need to be followed in the preparation and use of materials used in dentistry as the properties of these materials may be altered by variations in their manipulation. However, in the treatment of cases or the design of restorations so many variables enter that the number of possible combinations would tax man's memory.

In operative dentistry the chief variables are in the form of the cavity which is based on biological and mechanical considerations. These are not only of equal importance but so intimately linked that it is pointless to attempt a separation. In the teaching of a "standardized" cavity preparation all these variables are implicit but, unfortunately, the result is a composite preparation which may actually be correct for only a relatively small number of cases.

To overcome the deficiencies resulting from the teaching of "standardized" procedures, principles and their application should be taught. To be consistent the technic student working on a typodont or manikin should have it pointed out to him that he is treating a simple case without such factors as large pulp chambers, excessive decay, malalignment, malocclusion, et cetera complicating the operation. Having acquired skill in these cases he is now also prepared psychologically to go on to the more difficult operations in the clinic. It is my opinion that students trained in this way will reach the peak of their capabilities more surely and more quickly than by the "standardized" technic method.

My experience with state board examiners leads me to believe that they quickly recognize the difference between the student who knows "why" as well as "how" and the one who knows only "how." With more emphasis on understanding the chance of failure due to accident or an unfortunate choice of patient would be reduced.

Dr. Rule has made a number of other points with all of which I am in agreement but which would require too much time for their discussion. In closing I wish to compliment him on his excellent paper.

D. *Discussion*

FRANK G. EVERETT, M.S., D.M.D., M.D.[1]

I have enjoyed greatly the excellent paper by Dr. Rule and find myself in agreement on everything but details. In discussing the pressure at examinations, we must not forget that pressure occurs in practice too: apprehension is caused by uncertainty of one's own diagnostic ability and deficiencies in one's technical skill. It also involves questions of personality of the operator. The self-confidence which we wish to develop in our undergraduates reflects their own belief in their personality, operative skill, and diagnostic judgment. The practice of dentistry itself requires a certain degree of mental stability and equanimity of character; how else is one to face nervous patients from morning to evening for a lifetime? It seems to me that of the three requirements for stable, unhurried performance mentioned, great mental stability should be a condition sine qua non for a young person entering a dental school. Anybody that shows signs of being deficient in this respect should be discouraged from the beginning. Operative skill is emphasized properly in dental schools. I am in full agreement with Dr. Rule on the importance of having first rate instructors in the pre-clinical laboratory courses in

[1]Assitant Professor, Division of Oral Pathology, University of Oregon Dental School.

operative technique and on his advice that clinical and pre-clinical laboratory instructors be rotated in these courses.

Diagnostic judgment is difficult to impart, even more difficult than operative skill, I believe, because it involves experience, that is knowledge of what can be performed by one that already has the skill and has successfully met similar situations. In other words the student has to possess the operative skill first, at least to some extent, before diagnostic judgment can be acquired. I believe that most of us fully develop that faculty only after graduation. It is then primarily a nervous personality, one with insufficient operative skill or diagnostic judgment that becomes flustered at the time of examination. Omitting a particularly nervous personality—and I believe we agree that such a person should be discouraged from the study of dentistry—and granting that our schools do a creditable job in the teaching of operative skill it is lack of diagnostic judgment that we have to consider. I am in full agreement with Dr. Rule on the paramount importance of developing that faculty and considering the patient's overall dental needs. Requirements should not be permitted to interfere with the upholding of the intellectual honesty of the students and the training of their diagnostic ability in its full scope. As far as the practice of operative dentistry is concerned, this judgment includes the order of restorations in a specific patient's mouth, diagnosis of the suspensory apparatus of the tooth—a consideration often insufficiently given—choice of filling materials and last but not least the specific outline form of this one cavity and yes even the question of removal of all softened dentin. Test cases and test boards are properly emphasized by Dr. Rule in their importance for the development of self-confidence in our undergraduates.

A few words about the question of gold foil and the argument pro and con. Gold foil in the opinion of the Western schools is not only the best restoration available but also of superior teaching value, so that it can be well stated that a man capable of performing a satisfactory gold foil filling has learned the fundamentals of cavity preparation including the correct handling of rubber dam. In my judgment it is the use of the rubber dam and of the gold foil restoration that have made American dentistry leading.

In the teaching of operative dentistry as in all teaching every student reflects in some way the teaching he obtains. In his clinical years he will reflect the instructors in operative dentistry more than anybody else in the school. It is therefore of great importance in the coordination of the teaching of pre-clinical with the clinical subjects that the instructors

keep themselves fully acquainted with progress in these basic sciences, possibly by a schedule of rotating the younger clinical instructors for one or two terms in one of the basic sciences. Ever closer coordination, however, is not only necessary between clinical and pre-clinical subjects longitudinally, so to speak, but also between the different clinical subjects, particularly including periodontia, pedodontia and geriodontia.

Dr. Rule has stated: "The graduate of a recognized dental school in the United States should be capable of practicing dentistry and therefore capable of passing a State Board examination." Why is it that a considerable number of graduates of our schools fail at these examinations? In our sister profession of medicine it is considered a rare exception indeed for a graduate of an American school to fail in his state board examination. The teaching in medical schools throughout the country is certainly not any more standardized than that in dentistry. Is it perhaps the year of internship that most states require to be taken prior to admission to the examination of the board which matures the young graduate? I am inclined to think so. During this period of time the intern acquires additional skills, and particularly diagnostic judgment, while at the same time in the interest of passing the board examination he must constantly review and keep up with the development in the sciences. Are regional differences in the teaching of science courses and techniques greater in dentistry than in medicine? Are our state boards too regional in their outlook?

In answering the question whether dental schools should conform to state board requirements or the other way round, it seems to me that the state board has no additional information at hand that would render false or obsolete the teaching of competent instructors at recognized dental schools in this country.

It has been a pleasure to discuss Dr. Rule's excellent paper and I believe that he rightly emphasized his last point. Ever closer cooperation between schools, state boards and the dental profession is necessary. It is gratifying to hear of the excellent progress that is being made in this direction by the organizations working toward this goal.

COLLEGE NEWS

Edited by SIDNEY EPSTEIN, D.D.S., *San Francisco*

University of Pennsylvania:

ANNOUNCEMENTS

A second Mid-Atlantic Seminar in Oral Medicine is to be held in November, 1950.

Announcement is also made of extensive postgraduate courses to be held during the year.

University of Detroit:

ANNOUNCEMENT

Announcement is made of the Annual Home-coming day which was held in December with attendant successes.

New York University:

ANNOUNCEMENT

Some twenty-two postgraduate courses of instruction will be held during the year.

Tufts College:

ANNOUNCEMENT

Announcement is made of the First Annual Berkshire Conference in Periodontology and Oral Pathology for which course is a very large faculty with an extensive number of subdivisions of the general subject.

University of Tennessee:

ANNOUNCEMENT

A course in Dental Hygiene designed to train young women as dental hygienists for the general practice of Dental Hygiene and Public Health will be instructed with the fall term.

University of Toronto:

ANNOUNCEMENT

The school is currently making available to the profession laboratory facilities for lactobacillus counts and sterility tests for root therapy dressings.

Members of the Faculty and the undergraduates gave an extension course at the University of Hamburg under the auspices of the Unitarian Service Committee.

ANNOUNCEMENTS

The school has been given a complete Cephalometric equipment by the alumni chapter, Alpha Omega Fraternity.

Several continuation courses of one week duration have been satisfactorily conducted.

Medical College of Virginia:

APPOINTMENTS

Dr. S. J. Kreshover, Professor, Oral Pathology and Director, Dental Research.

Dr. George Z. Williams, Professor, Clinical Pathology.

Dr. Donald W. McCormack, Associate Professor, Oral Roentgenology and Oral Surgery.

Dr. George W. Burke, Assistant Professor, Operative Dentistry and Anatomy.

Dr. Charles C. Clayton, Assistant Professor, Chemistry.

Dr. Arthur B. Gathright, Jr., Assistant Professor, Clinical Medicine.

Dr. Paul Gibbons, Assistant Professor, Denture Prosthesis.

Dr. J. E. McIver, Assistant Professor, Denture Prosthesis.

Dr. Philip J. Modjeski, Assistant Professor, Dental Materials and Crown and Bridge Prosthesis.

Dr. Ralph M. Roberts, Assistant Pro-

fessor, Oral Pathology Diagnosis and Therapeutics, and Periodontia.

Dr. C. J. Vincent, Assistant Professor, Pedodontia and Oral Diagnosis.

Dr. Herbert J. Welshimer, Assistant Professor, Bacteriology and Parasitology.

Dr. A. F. P. Jacobus, Associate Professor, Oral Surgery and Exodontia.

Dr. W. M. Anderson, Associate Professor, Medicine.

Dr. William J. Caroon, Jr., Instructor, Operative Dentistry.

Dr. Gerald E. Fox, Instructor, Pathology.

Dr. W. C. French, Instructor, Pedodontics.

Dr. Jason R. Lewis, Instructor, Pedodontics.

Dr. R. I. Miles, Instructor, Operative Dentistry.

Miss Conway Bibb, Research Assistant, Pharmacology.

Dr. E. E. Pautler, Assistant Professor, Pathology.

Dr. James R. Turnage, Assistant Professor, Denture Prosthesis.

University of Pittsburgh:

Faculty Appointments

G. M. Stewart, Professor, Periodontia.

C. F. Brand, Professor, Dental Anatomy and Operative Techniques.

L. M. Monheim, Professor, Anesthesia.

J. C. Eselman, Professor, Radiography.

Sidi Bononi, Associate Professor, Anatomy and Oral Surgery.

C. B. Walton, Associate Professor, Ceramics.

Eleanore Reed, Associate Professor, Histology and Bacteriology.

D. L. Black, Associate Professor, Operative Dentistry.

Mollie D. Foster, Associate Professor, Pedodontia.

E. M. Heller, M.D., Associate Professor, Pathology.

Walter Raskowski, Assistant Professor, Dental Pathology.

S. Wah Leung, Associate Professor, Physiology.

C. R. Walker, Associate Professor, Dentistry.

J. C. Piazza, Instructor, Pedodontia.

Doris M. Stewart, Instructor, Pedodontia.

H. H. Kling, Instructor, Pedodontia.

Morton Tanner, Instructor, Pedodontia.

Jack Friedman, Instructor, Clinical Prosthesis.

J. C. Ziolkowski, Instructor, Clinical Prosthesis.

Jerome C. Harris, Instructor, Oral Surgery and Radiography.

University of Michigan:

Announcements

The University announces a general overhauling and enlargement of clinic facilities, including additional equipment.

Temple University:

Announcements

The school announces additional new equipment and other changes.

St. Louis University:

Announcements

The school is doing extensive remodeling in the Department of Exodontia and Oral Surgery, including a dedication exercise to the memory of the late Dr. George B. Winter, '00.

University of California:

Announcements

The faculty is now engaged in a detailed re-survey and study of the curriculum.

A new section on Oral Diagnosis has been established under the direction of Assistant Professor Gordon Agnew.

Professor J. Raymond Gill is on leave of absence to assist in reorganizing the De Montmorency School of Dentistry in Lahore, Pakistan.

Ohio State University:

ANNOUNCEMENTS

The school announces an extensive series of post graduate courses for the early months of 1950.

Northwestern University:

ANNOUNCEMENTS

The Dental School has taken full charge of the Dental Service of Children's Memorial Hospital. This service is to be under the direction of Dr. Gordon H. Rovelstad.

University of Kansas City:

ANNOUNCEMENTS

The school announces the rejuvenation of the Oral Surgery Department.

Washington University:

ANNOUNCEMENTS

The school announces the installation of a Cephalometer in the Department of Orthodontics.

The University was represented by Dean Brandhorst at the Inaugural Ceremonies of Dr. J. E. Wallace Sterling, the new president of Stanford University.

University of Southern California:

ANNOUNCEMENTS

Dean John C. Brauer has resigned to become Dean of the College of Dentistry of the University of North Carolina, a new school.

The school announces the organization of a Tumor Consultative Board and Clinic to provide consultation service with or for members of the medical or dental profession, and with or without a patient. This Board will be under the direction of the Oral Surgery Staff, whose Head will be Dr. H. F. Eckers.

University of Indiana:

ANNOUNCEMENTS

The University announces an extensive remodeling program, including a new Dental School Building, all completed. The announcement also includes nine new faculty appointments, including two for full time.

THE LIBRARY CORNER

JOSEPHINE P. HUNT,[1] *Chicago*

Librarians and those who have occasion to refer to the dental literature will be pleased to know that the Index to Dental Literature covering the period 1945-1947 is now ready. Original articles from 144 dental journals in the English language are included in the Index. Many editorials, biographies, obituaries and such items are also entered. A list of the dental books published during 1945-1947 is given. This volume is produced partially in regular type or letter press and partially in offset. The portion in offset was prepared on electromatic typewriters in the central office of the American Dental Association. The cost per copy is $10.

In the back of this 1945-1947 volume a list of the subject headings used in the Index to the end of 1947 will be found. Reprints of this list of headings with a supplementary list of the headings which have been added during 1948-1949 have been prepared and are available on request. This list will afford prospective subscribers to the Index an opportunity to study the headings used. It should also be helpful to those who are making their own files of the dental literature and to teachers in assigning subjects for themes.

Since January, 1933, many dental libraries have subscribed to the monthly

[1]Associate Librarian, American Dental Association.

card index to dental literature. This service, though extremely valuable, has been costly both to subscribers and producers. For sometime, earnest consideration has been given to the problem of cutting expense without offering a less usable service. As far back as 1939 libraries using the service were given an opportunity to express their preference for this monthly index on cards or a quarterly index on sheets. The numbers choosing each plan were about equal, but those who chose the quarterly sheets preferred that arrangement only if the entries could be cumulated. In 1943 and 1944 the problem was studied again but no method of improving the service at reasonable cost was presented at that time. The present plan contemplates quarterly cumulated paper bound booklets with a bound cumulation for the fourth installment at the end of each year. It is believed that this plan will provide as desirable a service as the monthly card index at half of the subscription price. It will also afford a wider coverage of material than was possible with a monthly card index. This new quarterly index will be produced by the Flexoprint method. The yearly volume will be well bound and with the same grade of paper as has been used in the regular bound volumes in the past.

Subscribers to the new quarterly Index are urged to express their opinion of the Index to Dr. Donald Washburn, Director of the Bureau of Library and Indexing Service, and are assured that any suggestions for its improvement will receive earnest consideration. At the reduced price it is hoped that dental libraries everywhere will cooperate with the American Dental Association by becoming subscribers. Through an increased number of subscribers it may ultimately be possible to reduce still further the cost of this valuable library tool. Dental educators are placing increased emphasis on the importance of good dental libraries and in a good library an Index is more necessary than ever before.

The following statement of interest to librarians appears in the *Army Medical Library News*, volume 5, February, 1950:

"The Army Medical Library has decided to bring the *Index-Catalogue* to a close. Following publication of the volume currently in preparation, the Library plans to publish a volume or volumes which will make the record of its monographic holdings complete up to the mid-century mark; and, beyond that, to publish selectively the most useful portion of the vast backlog of over 1,750,000 yet-unpublished references which have accumulated over the years.

"At the same time, the Library's Current List of Medical Literature will be augmented and improved in such a manner as to provide more effective service. An author index will be added; a standard list of journals to be covered regularly will be introduced; classification by broad journal groupings will be abandoned; the format and frequency of publication may be altered; and a cumulative subject index will be provided.

"Provision for a continuing record of the Library's monographic holdings has been assured in the form of an annual supplement to the *Library of Congress Catalog of Printed Cards*.

"The January Index number of the *Current List of Medical Literature* will appear the first week in February. Besides some minor changes in format and the addition of a limited number of cross-references to the subject index, a major innovation is the presence for the first time of a complete author index."

The process for producing the Quarterly Cumulative Index Medicus published by the American Medical Association is also being changed in order to place that publication on a current basis.

BOOK REVIEWS IN REVIEW

Conducted by DONALD A. WASHBURN, D.D.S.,[1] *Chicago*

BOOK REVIEWS IN REVIEW, *after lapsing for three issues, reappeared in the January issue, to present composite reviews made of quotations taken from reviews which have been published in the professional literature. The quotations are chosen for their value in summarizing the opinions of the reviewers and with due regard for the danger of lifting them out of their context. This department is one of no little importance in any educational field. The journals of* LEGAL EDUCATION, SCIENTIFIC MONTHLY *and many others allocate many pages to this department. It should prove valuable in the field of dental education as well.*

Oral and Dental Diagnosis, by Kurt H. Thoma; with contributions by Henry Goldman and Fred Trevor. Third edition; 563 pages, 776 illustrations, 60 in color. Philadelphia, Saunders, 1949. $9.50.

"This third edition of the work of Dr. Thoma on oral and dental diagnosis, while continuing to place fundamental emphasis on diagnosis, constitutes nonetheless, a complete revision of former editions with specific additions on treatment. The technics of examination are basic and it expands on the methods of scientific treatment. Many of the newer methods including the fluorides treatment, subgingival currettage, treatment of the intrabony pocket and fractures of the maxillae, are added features in this edition.

". . . The volume as a whole is a most worthy addition to the literature in this field and constitutes a ready reference as well as a study source for the progressive general practitioner as well as the specialist. It is highly recommended to the student of dentistry as a reinforcement to current curricula textbooks."—*Bulletin of the National Dental Association,* July, 1949, pp. 264-265.

"The book has the principal intent of helping the operator to establish a diagnosis. Secondarily it suggests specific treatments. It is not a book on basic pathology, as it tells only those things about each disease which will be of assistance in establishing recognition of the entity; it does not delve deeply into the theory and causes of diseases.

". . . Practically any dental condition to be met with in practice will be easily found in this book; it will be described in a brief but lucid fashion."—William P. Schoen, Jr., B.S., D.D.S., M.D.S. *Illinois Dental Journal,* December, 1949, 507-508.

"It appears to this reviewer that the terminology used is often over specialized and sometimes ill-chosen. Such controversial issues as the cause of dental caries, the description of an 'intra-bony pocket,' and the treatment of Vincents infection are too often glossed over with somewhat dogmatic coverage at variance with the findings of other authorities.

"A brief glossary of unusual terms and an adequate bibliography are appended. The color illustrations are reproductions of water color paintings.

"An effort has been made, with unusual success, to cover a broad field of general and oral pathology. The dentist who is familiar with the contents of this text will be far more competent to deal with oral disease than is the general practitioner of today."—David F. Mitchell. *Minneapolis District Dental Journal,* September, 1949, p. 59.

"Dr. Thoma and his associates have at-

[1]Librarian, American Dental Association.

tempted to outline all these phases of a complete diagnosis. They have listed all the local and systemic potentials. They have named all the diseases and given brief descriptions of each. In order to cover all this ground, the authors have sacrificed clarity and detail which are essential to a full understanding of the matter under discussion. At the same time, they have included some material which obviously does not belong in a book on diagnosis. In my opinion, the chapter on *technique* of x-ray has no place in a book on diagnosis, neither have the pages on treatment of fractures." —Louis R. Weiss, B.A., D.D.S. *North-West Dentistry*, January, 1950, p. 96.

"Oral and Dental Diagnosis is a volume which, if used for the purpose for which it was intended, namely as an aid and key guide for easy reference to diagnosis and treatment of dental disease, will make an invaluable addition to the libraries of the medical and dental students and practitioners."—Edward L. Sleeper. *Oral Surgery, Oral Medicine and Oral Pathology*, October, 1949, p. 1338.

"Oral and Dental Diagnosis, as is characteristic of all of Thoma's works, tends to enhance the status of the dental profession, and points in the direction which dental practice must travel if dentistry is to become an indispensable part of health service. This text is as necessary to the modern practice of dentistry as lubricating oil is to the internal combustion engine.—P.H.B. *Dental Items of Interest*, September, 1949, p. 987.

Oral Bacterial Infection, by Lyon P. Strean. 185 pages, 57 illustrations. Brooklyn, Dental Items of Interest Publishing Co., 1949. $5.50.

"Designed as a textbook or a ready reference for the practitioner, this volume is not intended as an exhaustive study of bacteriology and immunology but rather as a source of fundamental facts essential to the diagnosis and treatment of oral diseases. One chapter is devoted to the nature and application of antibiotics. Some detail is offered on the author's original investigations with Lactobacillus and Hemophilus pertussis. A chapter on immunity covers methods of handling serums and vaccines. A complete index gives many cross-references to facilitate use of the volume."—*Dental World*, Fourth Quarter, 1949, p. 265.

"To the student of bacteriology it is a volume indispensable, and to the general practitioner it gives a wealth of information that otherwise could be obtained only by extensive reading and research.

"For clearness and masterly presentation this volume should be in every dental school library and in the hands of every practitioner."—*Journal of the Ohio State Dental Association*, August, 1949, p. 155.

"Divided into 33 well written and readably presented chapters, it covers the subject of oral infection, diagnosis and treatment a bit more concisely and pointedly than in many similar treatises on these subjects. The condensed proportions of the volume and its well planned index, makes for easy and ready reference in specific cases. As a student's aid it has a specific place in textbook reference and refresher armamentarium. It likewise offers high value to the general practitioner of dentistry as both a reference source as well as a refresher aid in keeping abreast of the latest in diagnosis, treatment procedure evaluation or oral infections."—*Bulletin of the National Dental Association*, July, 1949, p. 265.

"It is unfortunate that inaccuracy and misconception are so common in a book in which space is allowed only for the fundamentals of the subject. For example, spores are said to be destroyed if kept for over thirty minutes at 100°C., leprosy is quite rare, galloping consumption is caused by the absorption through the blood stream of the tubercle bacillus, and Streptococcus viridans, being proteolytic, burrows

through the dentine. Septicaemia is used as a synonym for toxaemia; cow-pox and vaccinia are regarded as being the same. The statement that typhoid bacilli are digested in the stomach, releasing the toxic substance which produces the fever, is surprising, while that describing Pfeiffer's test 'if the organisms are lyzed the test is positive but if the organisms multiply, the diagnosis is suggestive of cholera' defies interpretation.

"The book as a whole fails to impress as a reliable and authoritative hand-book. The lack of clarity and accuracy in many places, together with the high price for such a small volume, make it impossible to recommend it for the use of students."—*British Dental Journal*, September 16, 1949, p. 163.

"The title of the volume in itself is misleading, as the contents are more those of a general bacteriology book with the addition of incomplete discussions of the diagnosis and treatment of conditions caused by some of the organisms. In neither the discussion of the organisms nor the discussions of the diagnosis and treatment does the author limit the book to oral infections. The illustrations for a book of this type are poor in comparison with those found in standard bacteriology texts, those of the organisms being drawings which are rather inadequate and several photomicrographs used being, in my opinion, incompletely labeled. The substance of the text has a standard approach to the discussion of each organism but, of necessity, in keeping the book so small many are incomplete and for this reason are of doubtful value."—Thomas L. Grisamore, D.D.S. *Illinois Dental Journal, December*, 1949, pp. 512-513.

"According to the preface it is the author's intention to supply a ready reference book for practitioners requiring certain basic information quickly and for medical and dental students preparing for final examinations. In addition, he proposes to deal with some of his own investigations concerning lactobacilli and the Hemophilus pertussis in some detail, and he also proposes to provide research workers and others with information about the methods employed in the study of bacterial endotoxins, exotoxins and toxoids. The subtitle promises that this text will be useful in diagnosis and treatment.

"Both the content and the carefully prepared index supply adequate support for the first objective. . . . The author's description of his own investigations is brief and wholly without references to the original publications. The text on toxins, endotoxins and toxoids is generous from the standpoint of students and general practioners but insufficient for use by technicians and research workers. The book is not a very helpful guide in diagnosis and treatment. Of the 57 illustrations, 16 are reproductions of photographs of not more than mediocre quality which add very little to the text."—Edward H. Hutton. *Journal of the American Dental Association*, November, 1949, p. 165.

Erratta

Two errors in names appeared in the January issue of the JOURNAL, due in part to a lack of understanding of the language and one to a typographical error. Referring to page 63, the name Rene Louvel Decano, Dean, should read; Rene Louvel, Dean. (The word Decano means Dean.) Then on page 71, the name Dr. Focion Debres Cordero, Dean, should read Dr. Focion Febres Cordero, Dean. The editor offers his apologies for these errors.

General Information

Address all correspondence relating to manuscripts and copy for publication in this JOURNAL to the editor, John E. Gurley, University of California, College of Dentistry, The Medical Center, San Francisco 22, California.

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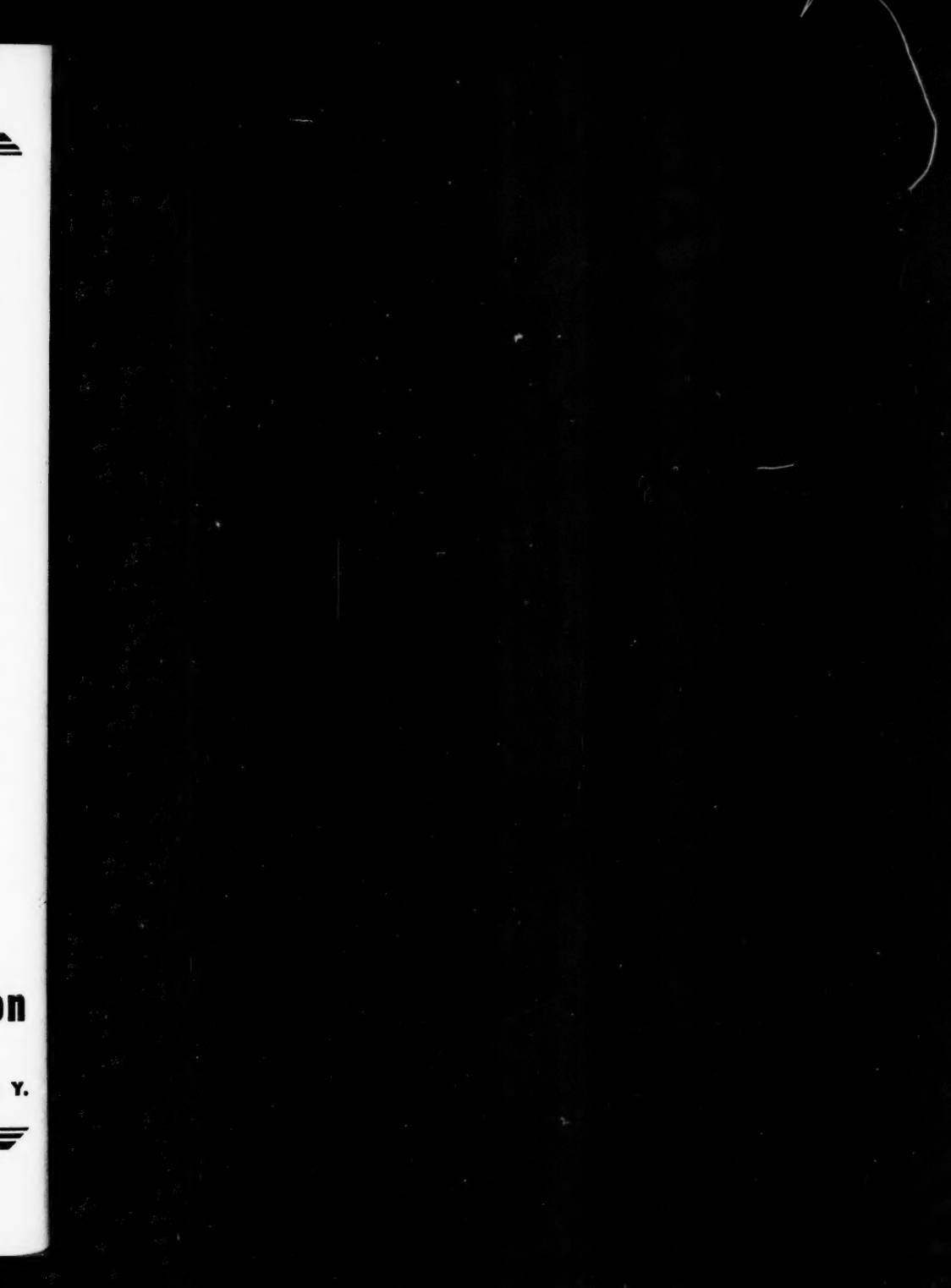
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